DOCUMENT RESUME

ED 379 789 EA 026 540

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TITLE	Handbook on Design Guidelines for Easy Access to Educational Buildings by Physically Handicapped Persons. Educational Buildings and Equipment 12.
INSTITUTION	Sweden Habitat, Lund.
SPONS AGENCY	United Nations Educational, Scientific, and Cultural Organization, Paris (France).
PUB DATE	May 90
NOTE	134p.
PUB TYPE	Guides - Non-Classroom Use (055)
EDRS PRICE	MF01/PC06 Plus Postage.
DESCRIPTORS	*Accessibility (for Disabled); Building Design; Design Requirements; Developing Nations; *Educational Facilities Design; Educational Facilities Improvement; *Educational Facilities Planning; Elementary Secondary Education; *Facility Guidelines; Facility Requirements; Foreign Countries; *Physical Disabilities; Physical Mobility; Visually Impaired Mobility; Wheelchairs

ABSTRACT

Research suggests that there is a positive relationship between low socioeconomic status and the occurrence of physical disabilities. Therefore, designing educational buildings that are accessible to the handicapped is one way to promote social equity. This handbook identifies design guidelines for creating equal access to schools and school facilities, with a focus on developing countries. The 1981 UNESCO guide, "Designing with Care--A Guide to Adaption of the Built Environment for Disabled Persons," serves as a model for the handbook. The design guidelines for the handbook pertain to moving, seeing, and hearing/speech difficulties. Following the introduction, the first section provides dimensional data for wheelchair users, people of varying physical statures, and people with visual impairments. The second section offers a series of illustrations that highlight basic physical requirements and identify potential problems. General design requirements are based on the principles of accessibility, reachability, usability, orientation, safety, and workability. The third section provides design recommendations for infrastructural facilities, building elements, specific areas, and classrooms. Sample building proposals from Cameroon, Central African Republic, Ethiopia, Guyana, Swaziland, Haiti, and Ecuador are included in the fourth section. A review of literature concludes that there is a lack of information, access, awareness, building codes, and research and development in most countries. It is recommended that countries conduct needs-assessment evaluations and set priorities for making schools more physically accessible. Appendices contain three annotated bibliographies. (LMI)

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Handbook on Design Guidelines for Easy Access to Educational Buildings by Physically Handicapped Persons

by
Lars Reuterswärd

under contract 105. 204. 8 with the
Educational Architecture Unit
UNESCO, Paris

The opinions expressed in this
document are those of the author
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Published by Sweden Habitat AB
in Lund, Sweden, May 1990.

Reprint by UNESCO, Paris, Sept. 1992.

ED/92/WS/12

PREFACE

"The year 1981 was proclaimed by the United Nations' General Assembly as the International Year of Disabled Persons. The theme: full participation and equality was adopted with the task of encouraging the rehabilitation of the world's estimated 450 million people who have some form of physical or mental impairment."

This quotation is from a Guide prepared in connection to this Year: **'Designing With Care - a Guide to Adaption of the Built Environment for Disabled Persons'** (UN/IYDP, Austria 1983). The Guide was financed by SIDA, the United Nations and UNCHS, and compiled by the Swedish consultant firm of White & Partners through Ms Lisa Hansson (principal contributor), Mr Kurt Axelsson and Mr Sten Söderström, architects SAR. Illustrations were made by Ms Birgitta Algesten and Mr Hans Grönlund.

The Guide is exhaustive and amply illustrated. It is indeed highly relevant in large parts for the subject of this Handbook, which is limited to 'design guidelines for easy access to educational buildings by the physically handicapped'.

For this reason, the Handbook follows the format of the Guide, and indeed reprints considerable parts of it as they stand, at times with additions or modifications. In the preparation of this Handbook, it has not been considered an end in itself to 're-invent the wheel'.

A further reason is that the Guide is reported to be out of print, some six years after it was published, and thus difficult to find for school designers of the next decade.

PLEASE NOTE: Text copied from the Guide can easily be distinguished from the new text, since the Guide's text is type-set, whereas the Handbook's additions are typed (ink-jet quality, like this Preface). Illustrations are from the Guide, whenever they are located adjacent to the Guide's text.

PREFACE

This Handbook was commissioned by Unesco (ED/EPP/EIF, Paris), and compiled by Sweden Habitat AB through Dr. Lars Reuterswärd, architect SAR. The Handbook reflects the views of the consultant and does not necessarily represent the official position of Unesco.

Permission to reprint parts of the Guide has duly been obtained from UNCHS and SIDA. For this I am grateful and most indebted to UNCHS, SIDA and the authors of the Guide.

Lund, May 1990

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INTRODUCTION

The Issue

It has been estimated that at least one child in ten in the developing regions of the world is born with or acquires a physical, sensory or mental impairment. A considerable part of these impairments is physical handicaps.

There is evidence that suggests handicaps are more frequent within the poorer countries than in the more well to do, and that within a country, handicaps are socially biased. That is to say, the poorer you are, the more likely it is that you will be physically handicapped.

To design educational buildings so that they are accessible for the handicapped is thus linked to the issue of promoting social equity.

This Handbook seeks to identify design guidelines, that would facilitate the access of the physically handicapped to educational buildings. The guidelines are not primarily intended for the design of special schools for handicapped pupils, but for schools in general.

The key policy issue is to avoid building barriers, so that handicapped persons can be integrated in the social life and normal educational system of a society. It is understood, that all recommendations of this Handbook cannot be observed in some cases, because of the additional cost implied.

Many educational buildings are externally funded, or built within less poor developing countries. In these cases, it seems reasonable to include performance criteria, to meet by the needs of the handicapped, into the brief before approving the project.

A number of measures recommended in this Handbook could however be observed at little or no cost whatsoever. It is basically an issue of attitude, and of information.

INTRODUCTION

The Issue

It is indeed sad to see how so many schools have built-in barriers, for no reason but negligence. It is therefore important that those who develop policies for educational buildings, and design and build them, should take account of the needs of the physically handicapped.

INTRODUCTION

Review of Literature

The "Unchs Trilingual Thesaurus in the Field of Human Settlements" (1986)[2] does not include the concept "physically handicapped", but states on "handicapped use: DISABLED PERSONS". Under this latter term, it gives the "related term: BARRIER-FREE DESIGN".

"BARRIER-FREE DESIGN" is defined as "design suitable for the special needs of disabled persons. Includes renovation to render buildings or infrastructure barrier-free". A broader term is "DESIGN" and a narrower term is "RAMPS".

Thus, the following terms should be primarily used when seeking documents on this subject, at least within the Unchs system:

* Disabled Persons
* Barrier-Free Design
* Ramps

The Research Subject Index of the Unchs "HABIRES / On-going research data base in the field of human settlements" (1986)[3] does not include the terms "Disabled Persons", "Barrier-free Design" or "Ramps", or any other term potentially relevant to our subject, apart from "Design". Under this term only one project is listed, and it clearly does not take our subject into consideration. The conclusion of this is that the demands of the physically handicapped on the built environment in developing countries is not the subject of current research, at least not within the Unchs sphere.

A broader review of current projects is provided by the "HABITAT DIRECTORY / Directory in the field of human settlements" (1986)[4]. It does not include any of the identified terms, but the total number of terms in this publication is considerably smaller than in HABIRES. It is likely that relevant projects exist, but under other key terms. A complete review of the projects to establish if this is so has not been done. At any rate, barrier-free design does not seem to be a key issue which merits its own term in this

INTRODUCTION

Review of Literature

The Unesco "EDUCATIONAL FACILITIES THESAURUS / PERMUTATED DESCRIPTOR LIST" (1981)[5] does not include "Disabled Persons", but the terms "Barrier-Free Design" and "Ramps" are included. In addition, it includes "Special Schools" (to be used instead of "Schools for Handicapped") and "Physical Handicaps".

Thus it seems as if the author of the Unesco Thesaurus has been considerably more aware of the importance of paying attention to physical handicaps, than the author of the Unchs Thesaurus.

The Unesco "CATALOGUE OF DOCUMENTS AND PUBLICATIONS" (87-88)[6] does not include a subject index, since it is gives the references under appropriate chapters.

Chapter 2 covers "Organisation of Schools & Out-of School Educational Systems Structures", and includes sub-chapter 2.8 "Special Education"/2.8.1. "Education for the Disabled". This chapter provides references to educational systems rather than design, why these documents are of limited relevance to our subject of study.

Chapter 6, on "Educational Facilities, School Construction", appears to be the most relevant. It includes 48 references, but the titles do not reveal that the documents pay particular attention to our subject of study. A more detailed review might however show that they do.

A number of Reports and Educational Building Digests from Unesco/Bangkok have been briefly reviewed. Out of these, one seems to explicitly include the idea that respect should be paid to the handicapped. That is the Educational Building Digest no. 13; "Design Guide for Student Housing". Under "Circulation", it states that ramps and corridors should be designed so that wheelchairs can be accomodated.

INTRODUCTION

Review of Literature

From the above it is clear that this handbook on 'Design Guidelines for Easy Access to Educational Buildings by the Physically Handicapped' (in developing countries) does not duplicate earlier publications by Unchs or Unesco.

There is however one UN document of particular relevance to our subject. This is the "DESIGNING WITH CARE - a guide to ADAPTION OF THE BUILT ENVIRONMENT FOR DISABLED PERSONS"[1], produced in connection with the 'International Year of Disabled Persons 1981 (IYDP) and sponsored by Unchs and SIDA.

This Guide is very useful to our study, and to the designer in general, since it is well structured, comprehensive, richly illustrated,and includes an illustrated(!) list of references. It could indeed be said, that it covers a considerable part of the subject of our study (indicated by bold letters): Handbook on **Design Guidelines for Easy Access to Educational Buildings by Physically Handicapped Persons**. 'Educational' is left out, since the Guide does not identify performance criteria in relation to the purpose of any particular kind of building, but rather on the general level, to 'Infrastructural Facilities' and 'Building Elements'.

The IYDP Guide will serve as the major reference and model, upon which this Handbook relies. The Handbook will limit itself to the implications of the general recommendations of the Guide for educational buildings. It goes without saying, that considerable parts of the text and illustrations of the Guide are directly applicable for educational buildings.

Whenever this is deemed to be the case, there is evidently no point in "re-inventing the wheel". Such text and illustrations are copied more or less as they stand, with permission.

INTRODUCTION

Review of Literature

The contribution of this Handbook is primarily to select examples from schools, and of schools (educational buildings), and to highlight aspects of particular relevance or that might need special attention.

To be fair, it should equally be said, that there is a large number of documents on design and construction for the physically handicapped. These documents are typically of a general nature, not specifically related to educational buildings, and usually produced within and for the North.

References to a number of these documents are provided in the Appendicies of this Handbook, which the interested reader is encouraged to consult for further reading.

GENERAL CONSIDERATIONS

Categories of Disabled Persons

Six categories of handicapped persons are referred to by WHO in the report "Training the disabled in the community" published in 1980, see appendix 2, annotated bibliography page 73. These categories are defined to the following:

- persons who have moving difficulties
- persons who have seeing difficulties
- persons who have hearing and/or speech difficulties
- persons who have learning difficulties
- persons who have strange behaviour
- persons who have fits

Within these principal categories there is a wide variation in the degree of disability occurring.

Multiple disabilities should also be considered e g by means of combination of recommended measurements.

Persons who have allergies are not included in the definitions but should of course still be considered for their specific problems.

These categories of disabled persons experience different problems with the invironment and therefore require a wide variety of different measures to be taken.

The categories of disabled persons dealt with in the Guide are described in order of their functional limitations and the causes of the disability.

For the purpose of this Handbook, design guidelines are limited to the first three categories, which are:

* moving difficulties
* seeing difficulties
* hearing and/or speech difficulties

The reason is that these difficulties more clearly affect design requirements, and a building that is accessible to these categories of disabled persons will respect the needs of handicapped persons in the the latter three categories.

It is to be regretted that this Handbook does not include specific design guidelines with respect to persons who have allergies. This is due to lack of information. The point of reference in this connection is the growing concern in industrialized countries with what is referred to as 'sick buildings'. A corresponding concern in developing countries is needed.

GENERAL CONSIDERATIONS

Categories of Disabled Persons

Persons who have moving difficulties. This is the group to which most planning and design guidelines refer. Two sub-groups may be distinguished, those who rely on walking aids or other technical supports and those who are confined to wheel-chairs.

In the developing countries wheel-chairs are few in number and their use is strictly limited for economic as well as environmental reasons. The built environment should therefore facilitate the use of wheelchairs as well as moving around with the help of various technical aids.

Ambulant disabled people may walk unsteadily, relying on a stick or crutches for support. In addition, they may only be able to walk short distances and may have difficulties in climbing stairs.

The needs of persons confined to wheel-chairs are related to the problems of moving around in a wheelchair, or working from it. Many requirements are therefore associated with the dimensions and characteristics of wheel-chairs. This is especially true for recommended dimensions given as planning guidelines in the majority of industrialized countries.

For the developing countries, a combined handdriven tricycle/wheel-chair has been developed which should be suitable for local manufacture in developing countries and which requires specific dimensions for access.

Difficulty in moving may be caused by a number of factors, including congenital accident, disease and geriatric reasons. Some diseases such as polio and leprosy, which are common in developing areas, will also inhibit movement if not properly treated.

Persons who have seeing difficulties. These persons have problems with orientation and mobility. Reading difficulties may increase orientation difficulties. However orientation can for some people be aided through the use of colour, illumination, and in certain cases the texture of material. Building design and layout which are simple and straight forward may increase the orientation possibility.

Blindness or acute seeing difficulties may be caused by disease, accidents, or by congenital factors. It should also be remembered that visual acuity is usually related to age. Diseases such as measles, trachoma, cataracts, etc, may cause blindness if not treated properly and in time. Other conditions such as river blindness, caused by a parasite, and which is common in the tropics may lead to blindness. Lack of vitamin A in a child's diet may cause blindness.

In the developing regions blind people are usually dependent on a helper, often a young member of the family.

Persons who have hearing and/or speech difficulties. These persons are seriously affected by the environment without showing any outward signs of their disability.

GENERAL CONSIDERATIONS

Categories of Disabled Persons

Since persons with hearing difficulties have difficulty in comprehending sounds or words in noisy environments, rooms should be acoustically well designed and insulated.

People with impaired hearing may rely on lip reading for communication, a technique which is helped by good general lighting.

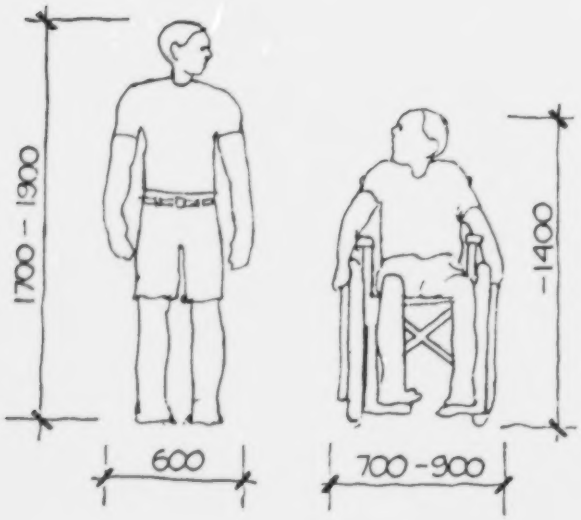
Loud-speaker systems in public buildings should not only be adjusted so as to be clearly audible, but supplementary visual information should be provided.

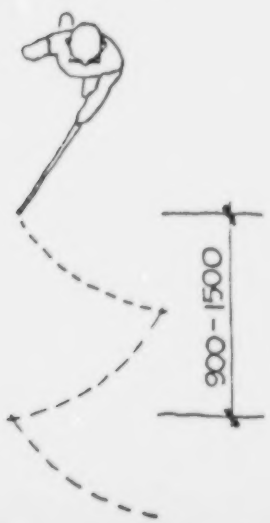
Deafness may be caused by diseases such as otitis, and mastoiditis which if not treated properly, will lead to hearing difficulties.

In addition to the six main categories **persons who have allergies** may be considered. Presently it is considered to be a small group in developing regions, but one can assume that this group is increasing. Albinos may be dealt with in the same category. Persons who have allergies may be sensitive to dust, mite, mildew, pollen, animal hair, formalin, turpentine, etc. Some people are sensitive to contact with substances and materials as nickel, chromium, and rubber.

GENERAL CONSIDERATIONS

Dimensional Data





Currently wheel-chairs are not widely available to, or used by disabled persons in developing countries. Nevertheless it is anticipated that wheel-chairs and other mechanical aids will become more generally available in the future.

By applying even at this stage, dimensional criteria from developed countries which take account of wheel-chair use, the built environment will be progressively adapted to this expected development.

Adequate space to allow for manoeuvring of wheel-chairs will generally ensure adequate space for disabled persons with other technical aids or with an assistant.

Dimensional data for designing with regard to the requirements of the disabled must refer to the scale of both people with and without mobility aids. In the industrialized countries these dimensions refer mostly to persons confined to wheel-chairs.

Wheel-chair dimensions and space requirements are of particular importance in buildings with respect to circulation spaces, passageways, etc.

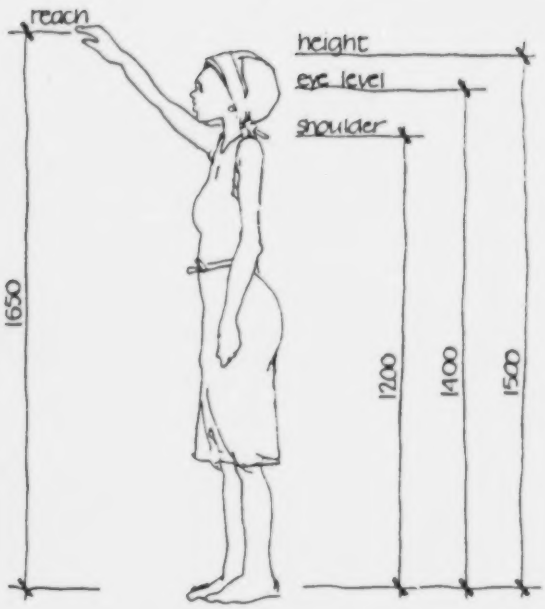
The length of wheel-chairs is generally between 1100 and 1200 m.

The width of wheel-chairs is generally between 600 and 700 mm.

The comfortable reach of persons confined to a wheel-chair is restricted to a zone between 700–1200 mm above floor level and not less than 400 mm from room corners.

GENERAL CONSIDERATIONS

Dimensional Data



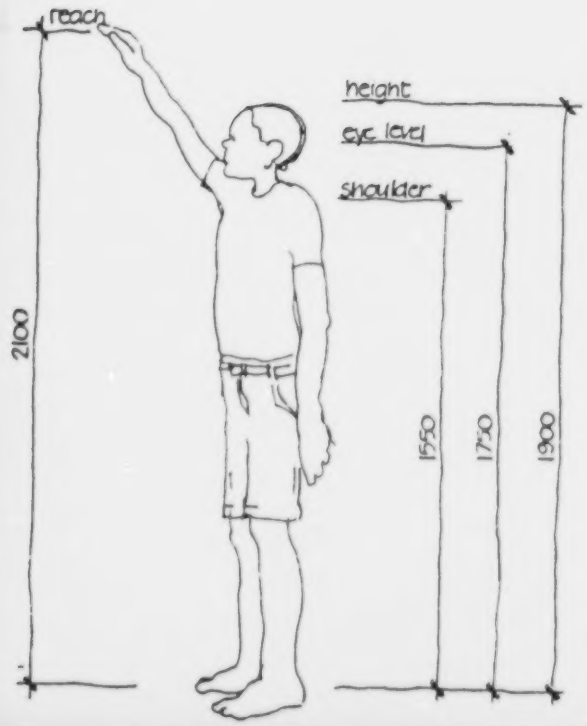
Requirements for manoueuvring space are always related to the activities to be performed. Different users perform activities in different ways, depending on individual performance and the type of wheel-chair used.

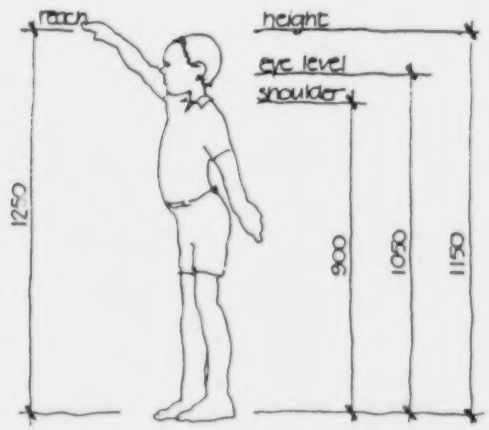
When planning buildings to cater for wheel-chair turning space, a circle of 1500 mm diameter is a suitable guideline.

For developing regions, it is proposed that dimensional data should reflect the standards being adopted in many developed countries which are based on wheel-chair use. This will ensure adequate space for the disabled person being supported by an assistant or using simple walking aids.

Consideration must be given to the fact that people vary in size and stature. Measures given here refer to average persons according to current international literature. It should be remembered, though, that people vary in size individually as well as regionally – for example the Masai people of Kenya, the pygmies of Central Zaire, or even the Japanese.

Design Guidelines for the adaptation of the built environment to disabled persons are currently being prepared in a number of countries, including Japan, where studies are being conducted by the Department of Rehabilitation at the School of Medicine, University of Tokyo and by Australian Council for Rehabilitation of Disabled, International Commission on Technical Aids. (See annotated bibliography page 79)





GENERAL CONSIDERATIONS

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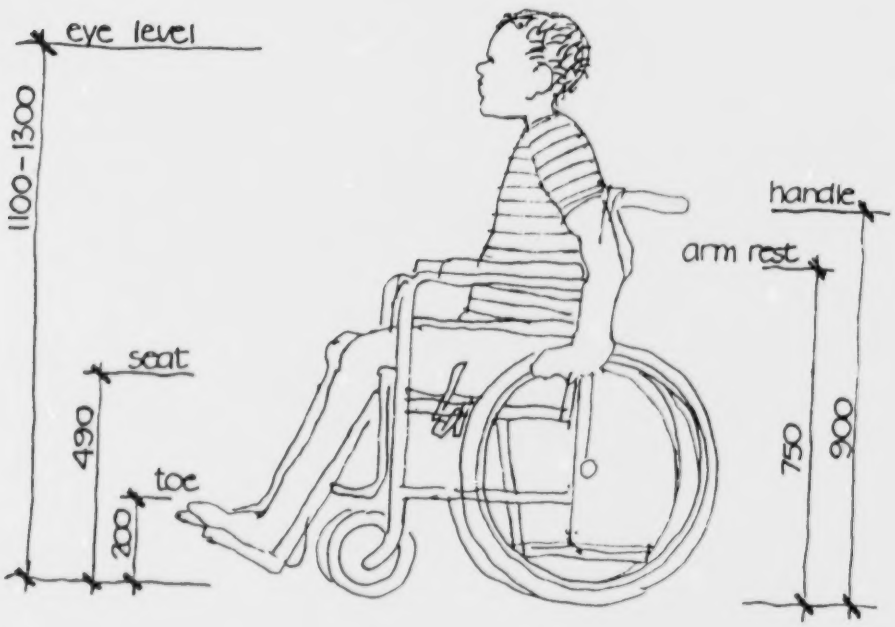
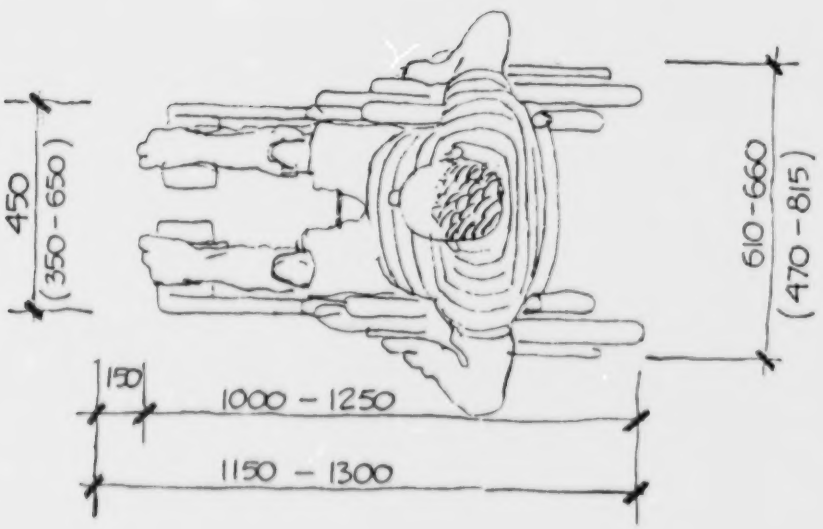
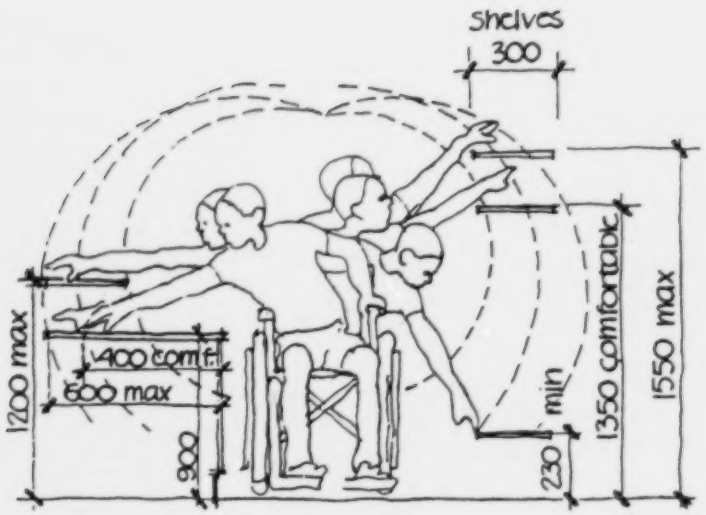
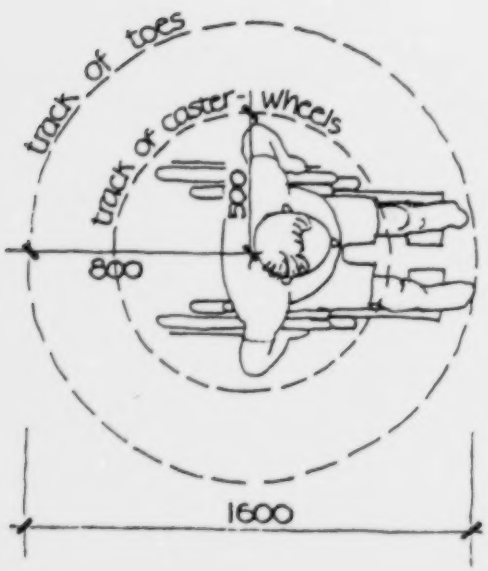


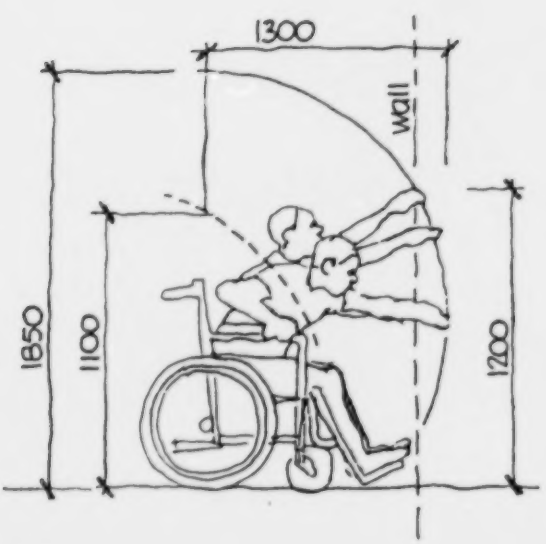


GENERAL CONSIDERATIONS

Dimensional Data







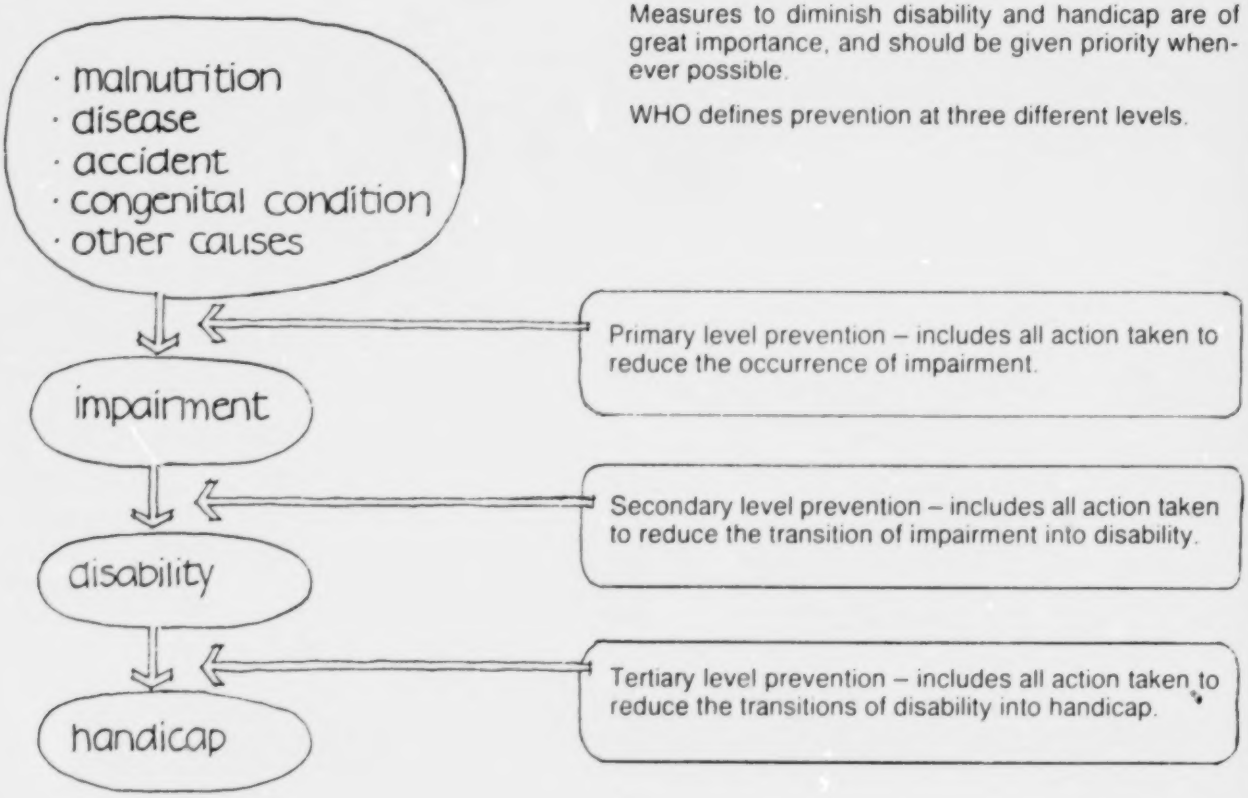
GENERAL CONSIDERATIONS

Prevention

The environmental approach to the prevention of disability is of great importance.

Measures to diminish disability and handicap are of great importance, and should be given priority whenever possible.

WHO defines prevention at three different levels.


· malnutrition
· disease
· accident
· congenital condition
· other causes
impairment
disability
handicap
Primary level prevention – includes all action taken to reduce the occurrence of impairment.
Secondary level prevention – includes all action taken to reduce the transition of impairment into disability.
Tertiary level prevention – includes all action taken to reduce the transitions of disability into handicap.

It is at the primary level that prevention is perhaps most important and beneficial.

While the population will always contain a proportion of disabled persons, every effort should be made to ensure that impairments do not occur in the first place.

The WHO publication "Training the Disabled in the Community" provides a summary of the most important measures to prevent disability. This publication shows how design of the physical environment plays an important contributory role in preventing impairment and avoiding disabilities.

A summary of the most important measures to prevent disability as defined by WHO is given in Appendix 4, page 85.

The implementation of preventive measures may often be seen as the responsibility of "society". In developing regions the traditional "extended family" is likely to remain the basis for economic, social, and cultural life.

ENVIRONMENTAL CONSIDERATIONS

Basic Physical Requirements

reach
enter
use

The UN goal "full participation and equality" implies that no part of the built environment shall be designed in a manner which excludes certain groups of people by virtue of their disability.

To achieve a good environment there is a number of guiding principles which are recognisable. Reference to these throughout the planning and design process will ensure a high degree of adaptation. These basic principles can be formulated as follows:

it should be possible to reach all places and public buildings;

it should be possible to enter all public buildings; and

it should be possible to make use of all public facilities and environmental arrangements.

These basic guiding principles may be interpreted into a series of five or six general requirements which should be considered in the physical planning and design. These general requirements may be summarized as follows:

- **accessibility** – the built environment shall be designed so that it is accessible for all people
- **reachability** – provision shall be made in the built environment so that as many places and buildings as possible can be reached by everybody
- **usability** – the built environment shall be designed so that it can be used and enjoyed by all people
- **orientation** – the built environment shall be designed so that it is easy to orientate and find one's way in
- **safety** – the built environment shall be designed so that people can move around without undue hazard to life and health.
- **workability** – places of work – both offices and industrial premises – should be designed to allow participation and contributions by disabled people.

Constant reference to these basic requirements during the planning and design process will help ensure that the possibilities of creating a good environment will be substantial.

A good environment which satisfies these requirements, can be obtained in a variety of ways. These include the removal and avoidance of physical barriers, unnecessary changes of level and steps, the provision of adequately dimensioned entrances and doorways, sufficient circulation space, and by simple layouts and careful design.

ENVIRONMENTAL CONSIDERATIONS

Problem Identification and Design Requirements

In order to provide a basis for the formulation of suitable design criteria, attention is given in this section to prevailing problems in the built environment and to the difficulties facing disabled persons.

Attention is put on common problems which arise for disabled persons in the built environment.

The illustrated examples of problems have been grouped according to their relative position in the built environment, namely:

- **moving about, the space between buildings**
- **entering buildings**
- **internal communications, horizontal and vertical**
- **individual rooms.**

The groups of examples of problems have been organized from the "whole" of the built environment down to individual "parts". The examples of physical barriers which illustrate general problems are given as a background to the formulation of general design criteria. These criteria provide a basis for design of the environment in such a manner that obstacles and barriers are avoided.

ENVIRONMENTAL CONSIDERATIONS

Problem Identification

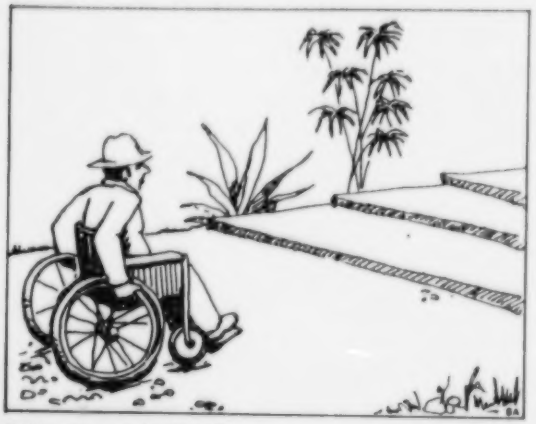
Obstacles which cause difficulties to movement between different parts of the outdoor environment constitute a conflict with the basic requirement of orientation and accessibility. The problems which arise are often associated with movement between buildings on roads, paths, footways, etc.

Orientational difficulties

Orientational difficulties – such as finding the entrance to a building – cause delays, irritation, and exhaustion for the ablebodied as well as for the disabled persons. For a person with moving difficulties, finding one's way quickly and directly, without mistake or detours, is often a major problem. For persons with hearing difficulties, or those who are unable to ask the way, it is irritating.

Interruptions in foot paths

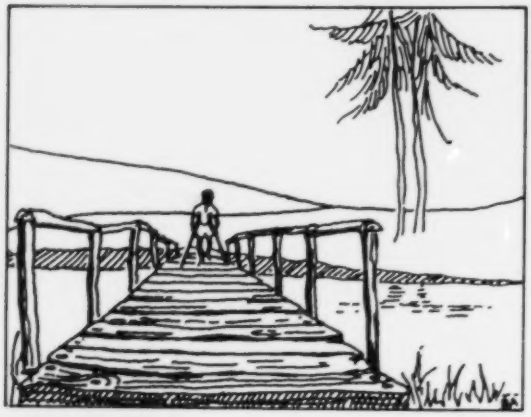
Interruptions in the pedestrian foot path network are both an inconvenience and a danger, especially if it means that pedestrians are forced to use the roadway instead. Such interruptions are common where roads cross a river or railway on a narrow bridge. For persons who rely on wheel-chairs or other mechanical aids, an incomplete pedestrian footpath makes further travel extremely difficult without substantial help. Having to compete for space on a road with vehicular traffic involves danger, with the risk of accident and injury.



Differences in level

Differences in level on roads and foot paths are virtually impossible to avoid even in relatively flat terrain. The use of steps to bridge a change of level makes access impossible for persons confined to wheelchairs. The situation is nearly as bad for persons using bicycles or any form of wheeled transport. In order to promote a segregation between motor vehicles and pedestrian traffic, pedestrian systems with suitably graded ramps should supplement flights of steps.

ENVIRONMENTAL CONSIDERATIONS

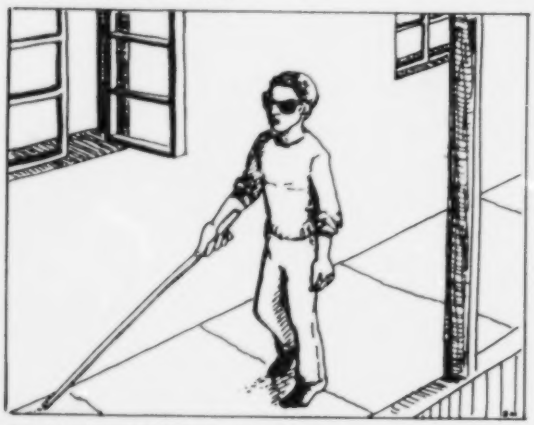


Uneven surface

Uneven surfaces or paths full of ruts or holes are difficult to walk on even for normal persons. For disabled persons uneven surfaces make movement even more difficult. Pushing or pulling any form of wheeled transport, such as a wheel-chair, will involve large effort and cause slow progress. For visually disabled persons uneven surfaces will be an extra hazard, while slippery surfaces are extremely difficult for persons relying on crutches or using a walking-stick.

Obstacles and holes

Obstacles on the ground can be of a temporary or a permanent nature, and may be considered as interruptions in the road or pedestrian network. Climatic conditions, e g heavy rains, may increase the problem. For those with moving difficulties obstacles will mean an irritating detour. For the blind or visually impaired obstacles will pose a further hazard over which they can stumble and hurt themselves.



Projecting building elements

Obstacles such as projecting building elements are a further safety hazard in the built environment. Examples of such obstacles are projecting signboards at low level, low doorways, open staircases, balconies and windows or shutters which do not open 180°.

Design Requirements

Pedestrian routes in the built environment shall be designed in a manner which makes them possible to use when moving from any one entrance to another. This means that communication routes should be easy to find, continuous, easy to use, free from unexpected obstacles, have a firm surface and be properly dimensioned.

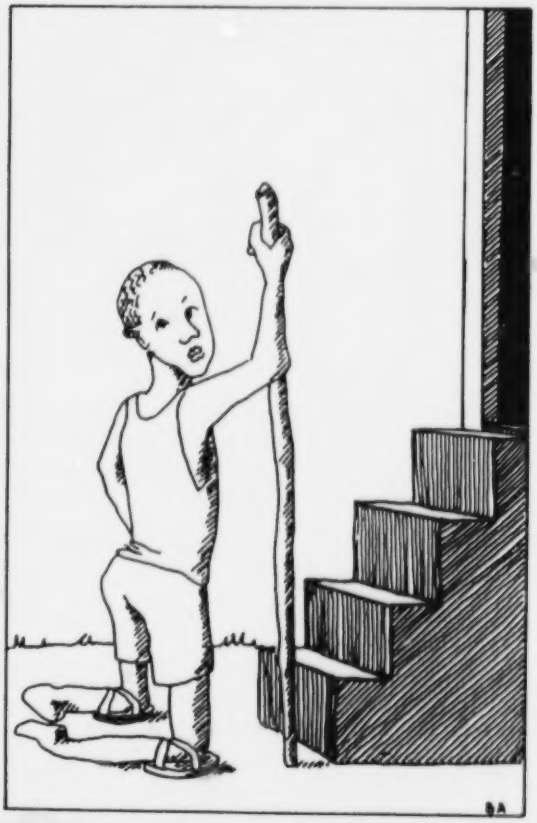
ENVIRONMENTAL CONSIDERATIONS

Problem Identification

A variety of problems connected with entering a building or a vehicle can be readily observed. Problems associated with entering a building can be related to those of orientation and those of accessibility.

No distinct entrance

Difficulties in finding the entrance may be caused by confusing or illogical design, excessive repetition of similar design elements, or a lack of adequate sign-posting.

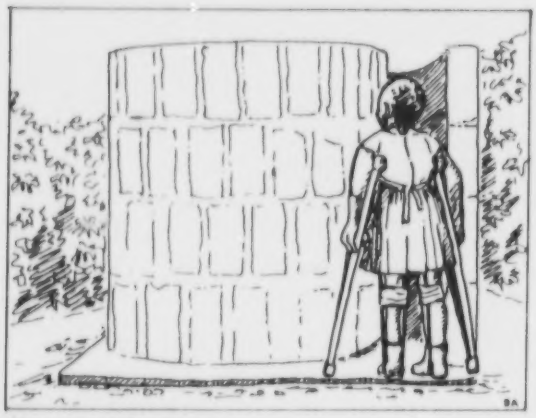


Difference between outdoor and indoor levels

Differences between external ground levels and internal floor levels are common, and frequently there are entrance steps in front of public buildings.

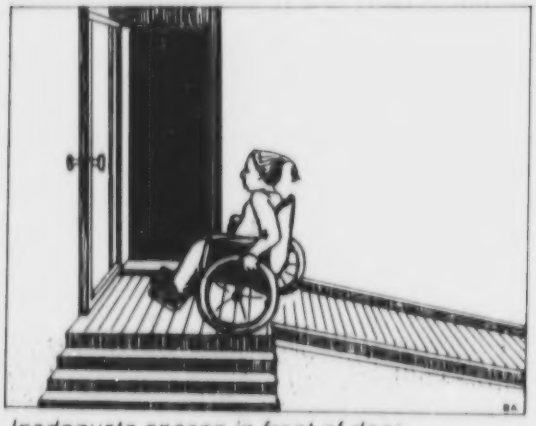
Reasons for raising the ground-floor of the building may vary from pure architectural aesthetics to practical avoidance of seasonal floodwater. However, with regard to accessibility for disabled people such a difference in level is a complication.

ENVIRONMENTAL CONSIDERATIONS



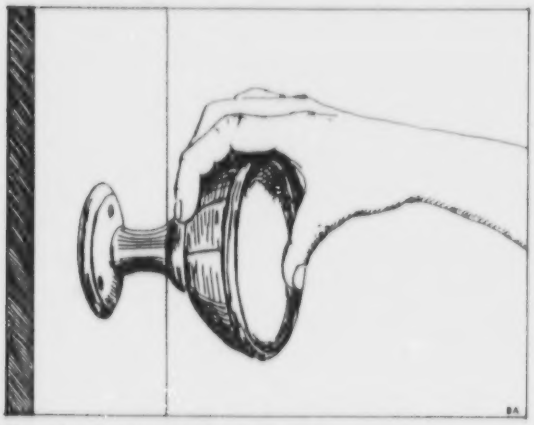
Narrow entrance

With regard to functional dimensions, narrow entrances to buildings or vehicles can make access for wheel-chairs impossible, and cause difficulties for persons relying on crutches, or being assisted by a second person.



Inadequate spacen in front of door

Inadequate space in front of doors. The unobstructed circulation space in front of, or behind a door, is sometimes too small to allow manoeuvring of a wheel-chair or to accommodate a person with other walking aids. Wrongly hung doors or opening direction may further encroach on this limited free area.



Poorly designed door handle

Poorly designed and wrongly located door handles are a further problem for many disabled persons when alone.

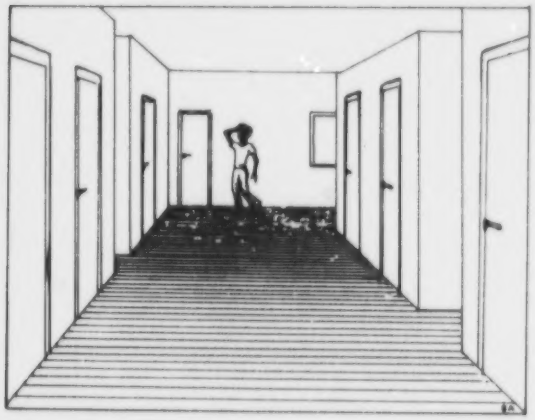
Design Requirements

At least one entrance to every building shall be easy to find and easy to use by any persons irrespective of whether they have impaired movement or seeing difficulties.

ENVIRONMENTAL CONSIDERATIONS

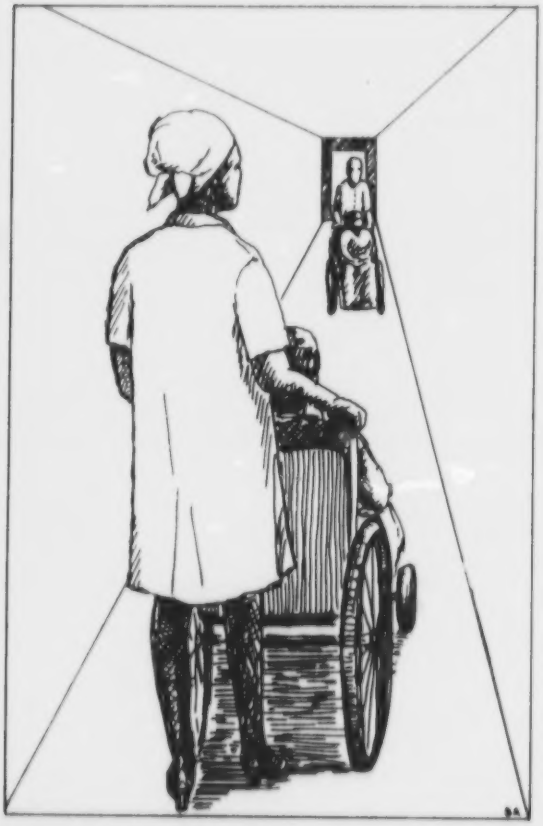
Problem Identification

Moving from the entrance area of a building to the various rooms may be difficult or even impossible for some disabled persons. If the building is not properly designed, problems of orientation, accessibility and/or usability may easily occur.



Lack of proper labelling

A lack of labelling or room identification can cause immediate problems for a new visitor to find the way. In buildings where blind visitors can be expected, direction signs and room labels with embossed (raised) letters or braille text should be used.



Long and narrow corridor

Long monotonous corridors may create just as many orientation difficulties as winding corridors where no outdoor reference points can be recognised from windows.

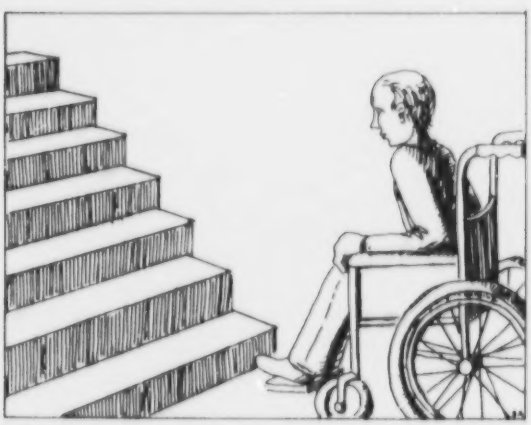
Poor lighting tends to increase people's orientation problems. Excessive contrast of light and shade, such as through windows placed at the ends of corridors may cause dazzle. Low levels of illumination, or windowless corridors, may cause orientation and seeing difficulties, especially for persons coming into the building from bright sunlight.

Narrow passageways are an obstacle to persons confined to wheel-chairs and those who rely on assistance from a second person.

ENVIRONMENTAL CONSIDERATIONS

Narrow doorway

Narrow doorways, restricted openings, and doors hinged on the wrong side or opening the wrong way can make accessibility impossible for persons confined to wheel-chairs.



Stairs

Different levels within a building are often unnecessary. These changes of level make unhindered accessibility impossible for some categories of disabled persons, and are a hazard for others.

Design Requirements

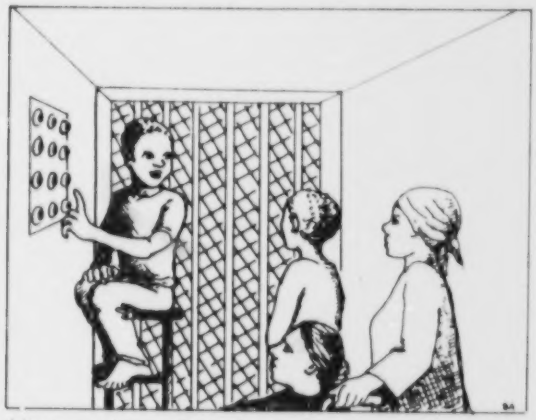
Indoor communications linking the entrance area with the various parts of a building shall be easy to find and follow, be well dimensioned, and have a good standard of lighting. Differences in levels should be clearly marked and adequately dimensioned.

Doorways shall be dimensioned to facilitate use by a wheel-chair or other moving aids.

ENVIRONMENTAL CONSIDERATIONS

Problem Identification

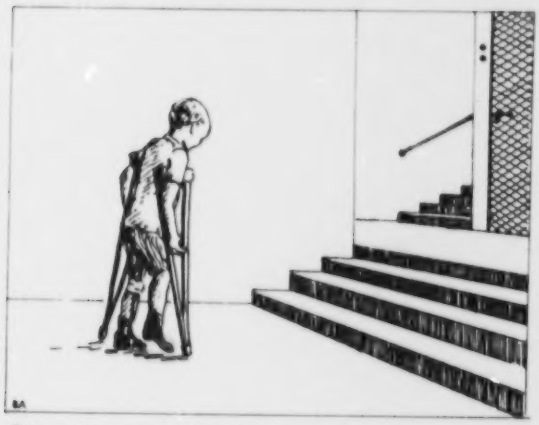
The problem of moving from one floor to another can be acute for persons confined to wheel-chairs. Stairs, ramps, and lifts are the only conventional means of linking together different floor levels in a building.



High position of control panel

Lifts are an accepted method of reaching other floor levels than the ground or entrance floor. However, consideration must be given to the fact that lifts become inoperative in the event of a fire or electrical power-cut, when the only means of movement between floors is by the staircases.

Lifts of inadequate size, or with too narrow doorways are no help to persons confined to wheel-chairs. Even badly positioned control buttons or door-handles can make independent travel by disabled persons impossible.



Steps to reach the lift

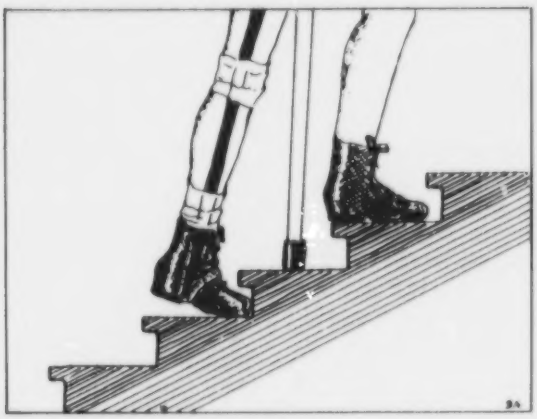
A building design which involves the use of steps in front of the lift's stopping point makes the lift impossible to use by many disabled persons. Sometimes lifts are designed to stop at a landing or mezzanine floor between two principal floor levels. The reason for this design principle is to halve the number of possible lift stopping points and thereby speed-up vertical communications in high-rise building. Such an arrangement does not allow use of the building by disabled persons. For many others the design principle is unsafe and awkward.

Steep staircase

Badly designed staircases, including those which are too steep or have irregular steps, are a hazard to all people.

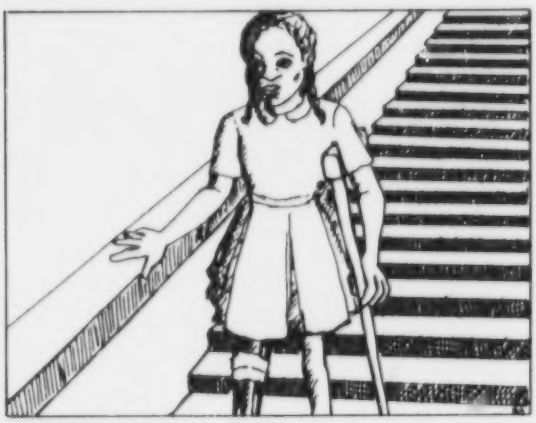
Winding staircases or stairs with varying levels of illumination may make some people feel dizzy. This phenomenon would be extremely hazardous for that group of persons which is liable to have fits.

ENVIRONMENTAL CONSIDERATIONS



Steps which hinder the foot

Badly designed steps, wrongly proportioned treads and risers, steps with projecting nosings, sloping treads, and slippery steps are both difficult and dangerous for many people to use, and may be impossible for use by disabled persons.



Handrail which is impossible to grip

The absence of handrails, or badly designed or wrongly positioned handrails adds to the problems of use.

Design Requirements

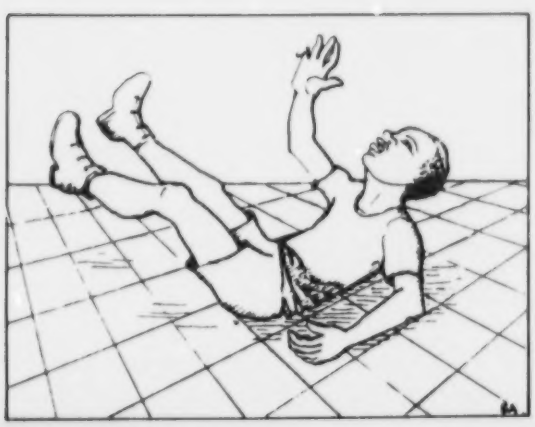
When lifts are installed, at least one of these shall be designed so as to be accessible to, and usable by, a disabled person.

Staircases shall be designed so as to be safe, well dimensioned, adequately lighted and equipped with suitable handrails.

ENVIRONMENTAL CONSIDERATIONS

Inadequate space

Noisy environment



Slippery floor

Problem Identification

The problem of use of rooms is related to room dimensions, equipment and fixtures as well as to acoustics and illumination.

Badly designed or badly located room features such as light switches, taps, door and window handles or catches, supplementary controls, etc, may counteract the benefits of an otherwise good room design. As a result a part of a building may become unusable for some people.

The absence of information boards, signs or labels may cause confusion, delay, and irritation.

Space, especially in small rooms such as washrooms, toilets, telephone cubicles, etc, may be crucial in determining whether facilities can be used by disabled persons or not. This is particularly true where there is insufficient space for a wheel-chair to enter and manoeuvre, or for a mother with several children to use the room.

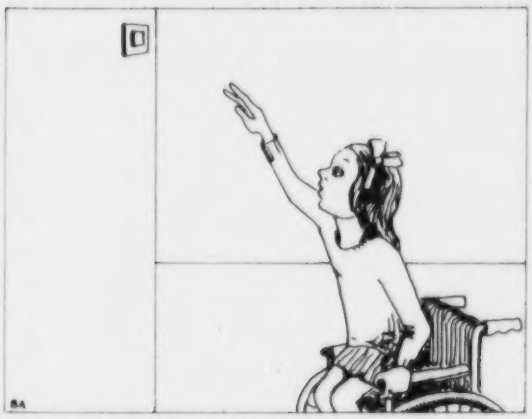
Equipment, fixtures or furniture of inappropriate design or placing may make an otherwise good room layout or plan arrangement unusable.

The acoustics of a room are also important, especially for persons with hearing difficulties or using simple hearing-aids. Any irrelevant sound from outside or from adjacent parts of the building may make it impossible to hear a speaker.

Poor room acoustics with echo effects can also make listening to and understanding conversations unnecessarily difficult.

Polished surfaces can be extremely slippery and hazardous.

ENVIRONMENTAL CONSIDERATIONS



Unreachable switch button

Illumination levels in rooms and corridors are an important consideration both for persons with seeing difficulties as well as for effective work by persons with normal sight. Inadequate or poorly positioned lighting fittings can cause reflections as well as poor illumination.

Switches, buttons, taps, handles, etc which are difficult to find and/or reach are a common obstacle for disabled persons.

Tap which is difficult to grip

Poorly designed switches, taps, and handles may be stiff or difficult to operate, especially for persons who have retarded movement, little strength and precision. In addition, taps and other controls which are located in the corners of rooms or near walls, may be difficult or even impossible for some disabled persons to reach.

Poor equipment may also limit the use of certain rooms and building areas. The absence of grab rails for persons who cannot stand unaided may make an otherwise adequate toilet arrangement, involving a WC or pit latrine, impossible to use.

Sign which is difficult to read

Incomplete or unclear signs can cause more confusion than no sign.

For persons who cannot read informative symbols may be required.

The absence or poor design of signs, inadequate size of lettering, poor positioning, or confusing colours, etc, will pose problems for all visitors. Such conditions will only make it more difficult for disabled persons.

Design Requirements

In order that rooms can be used by everybody they should be dimensioned so that there is sufficient space for a wheel-chair, a person using crutches, or a person relying on an assistant. All fixtures and fittings should be appropriately designed and correctly positioned. Good illumination and appropriate acoustics should always be aimed at

Signposted information of different kinds improves accessibility and usability, and assesses orientation.

DESIGN RECOMMENDATIONS

This chapter of the Guide contains a series of recommendations regarding the most commonly used and evaluated design features in respect of dimensions and proposed technical solutions. If applied with care, these design recommendations can greatly assist the architect or planner in creating an environment which encourages mobility and participation of disabled persons in society.

The appropriate level of adaptation is determined by the likely use of the building. Public facilities should be adapted to a certain basic level of accessibility by disabled persons. Larger housing developments should ensure that a proportion of the dwellings, most appropriately those at ground level, are adapted to the needs of disabled persons.

When designing a new building, or adapting an existing one, it should be determined whether the building is to be used by a particular category of disabled persons to which special attention should be given, such as schools for deaf children or other specific facilities. For each specific project it should also be borne in mind that the performance and mobility of disabled persons varies. Variations also occur in the average size of people in different parts of the world.

Forethought and design adaptation in new buildings can often ensure that design recommendations for disabled persons can be achieved without special effort or extra cost.

Design recommendations for disabled persons should therefore be treated by the architect, planner or engineer in the same way as attention is already paid to fire regulations, structural standards, or climatic adaptation.

INFRASTRUCTURAL FACILITIES
Transport Systems
Pedestrian Network
Footpaths and Roads
Street Furniture
Sign Posts

BUILDING ELEMENTS
Entrances
Doors
Ramps
Staircases and Steps
Handrails
Lifts
Windows
Sanitary & Electrical controls
Signs

Certain Areas

DESIGN RECOMMENDATIONS

Transportation Systems

Public and private transport systems are, for many disabled persons, of great importance for moving around between various parts of the environment and participating in society. Access to, and the possibility of using transport systems is therefore extremely important.

Buses and bus-stops

Buses should preferably be designed to allow disabled persons to enter them without undue difficulty.

Technically advanced solutions with low-level bus floors are not yet practicable. Bus-stop waiting areas may be built up slightly to reduce the stepping distance into the bus. However, even this measure requires precise positioning by the busdriver and can involve a dangerously high kerb. There is also the need of a sloping approach to the bus stop which can be difficult to accommodate in confined urban streets.

The width of at least one of the bus doorways should be 1.0 m to allow access by persons in wheel-chairs or using crutches. No central grab handle should block this entrance. All door openings should be provided with adequate grab bars on both sides so that disabled persons can help or steady themselves when entering or leaving the bus.

All buses should include at least one seat close to the entrance especially allocated to disabled persons. This seat should be 0.40 m above floor level and have extra space in front. Extra grab bars and/or handles should be provided.

The destination of buses should be clearly marked on the bus in addition to any route number. This will assist persons with hearing or speaking difficulties who cannot ask the way.

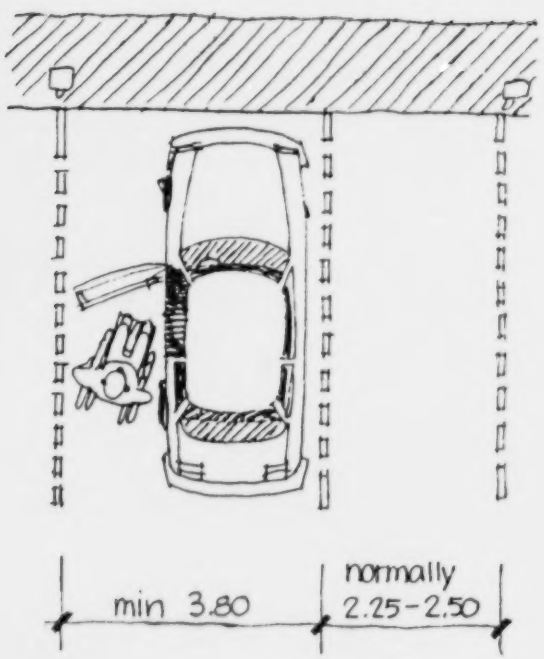
Taped announcements for next stops may also be considered.

To aid blind people, or those who have severe seeing difficulties, the bus-stop waiting area should be laid out logically and safely. Queuing positions and the end of any waiting platform should be clearly recognisable with a stick.

Route maps, time-tables, and other bus information should be prominently displayed as well as being clear, concise, and well designed (see also Signs).

DESIGN RECOMMENDATIONS

Transportation Systems



Trains

There may be technical reasons for the almost universal difference in level between train and bus floors, and platforms.

These differences should, however, be avoided as much as possible. This can often be attained in new train systems if attention to this problem is being paid straight from the planning stage.

Similar criteria as applied for buses should be used for trains. Platform levels should correspond as well as possible with the floors of carriages or entry steps. Special seats close to carriage doors should be designated for disabled persons.

At stations where public address systems are used, loudspeakers should be mounted and oriented so that they can be clearly heard.

Car Parking

A disabled person can achieve considerable independence by driving his or her own car. In order to obtain the greatest benefit from this independence it is required that special parking spaces for disabled persons are reserved as close as possible to each building entrance and other public facilities. Ideally such parking spaces should be adjacent to the main entrance and at the same level so that access is not limited by steps.

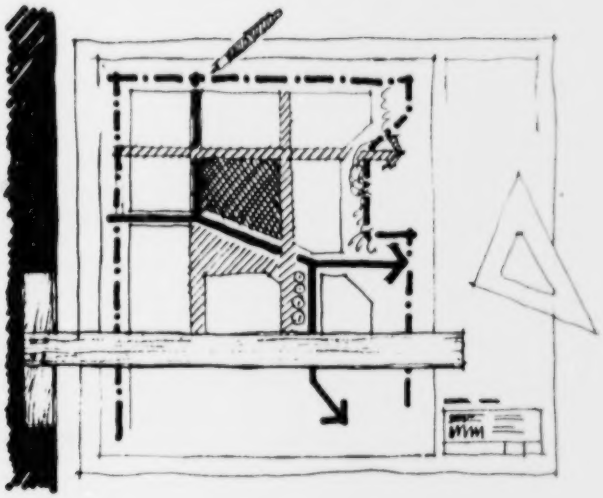
There should be a clear space on one side of a parking space reserved for persons confined to wheelchairs or other walking aids.

Provisions should preferably be made to shelter parking spaces reserved for disabled persons from the sun and rain.

DESIGN RECOMMENDATIONS

Pedestrian Routes

A continuous pedestrian network, usable for all groups of people, is necessary to ensure that the urban area is accessible to everyone.



Master Plan

Consideration must be given at the initial master plan stage of how pedestrians are to move about and move between different parts of the urban area. If a continuous and seperate pedestrian network system can be created, connecting the more important destinations in an urban area this provides good conditions for the creation of safe pedestrian routes for all people at the later detailed planning stage.

A comprehensive pedestrian system which is adapted to the needs of disabled persons should be constructed in such a way that it connects with local footpath networks and public transport systems.

Only at certain strategic points should the pedestrian system meet the road network so that disabled persons can enter and leave motor vehicles directly from the footways.

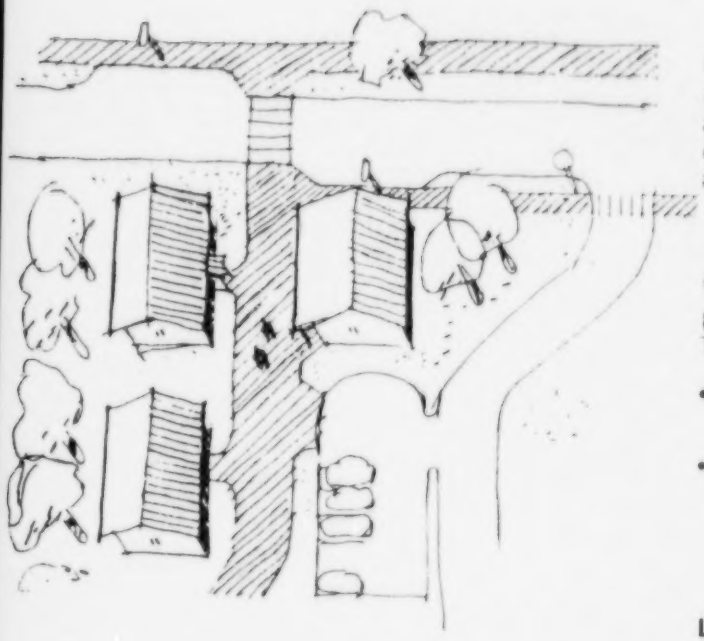
Footways and footpaths should form a network for pedestrian movement between all major points in an urban area. Special attention should be paid to providing effective pedestrian links with bus and rail terminals, as well as nodal-interchange points such as bus-stops, car-parks, ferry terminals, etc.

A generally accepted ambition is that the pedestrian network should be segregated from vehicular traffic as much as possible. Such segregation can usually be accomplished horizontally, but at points where pedestrian ways cross major traffic routes consideration should be given to the possibility of vertical segregation.

Wherever possible pedestrian ways should take the shortest and most level route as it is difficult to use ramps without assistance.

DESIGN RECOMMENDATIONS

Pedestrian Routes



Local plans

In drafting local plans and traffic schemes it is necessary to carefully investigate how the pedestrian network system can be designed to give all people the possibilities to reach all buildings and their entrances.

Unnecessary interruptions in the pedestrian network should be avoided. Where possible, vehicular traffic and pedestrian traffic should be separated from each other horizontally or vertically where site conditions and economic considerations allow.

When drafting detailed "action area" plans it is important to provide good orientation for pedestrians. This can be achieved for instance by:

- footpaths leading directly to destinations without unnecessary detours or changes in level
- footpaths which follow buildings, vegetation, etc and make it easier for people with impaired vision to orientate themselves and identify where they are.

Layout plans

Within a specific site area it should be considered that traffic flows are separate for pedestrians and vehicular traffic. It should further be considered that person flows are effective with the regard to the function of the site facilities, eg well organized patient flows at health care facilities.

DESIGN RECOMMENDATIONS

Footpaths and Roads

The design of footpaths and roads determines whether or not it is possible for disabled persons – in the first hand those with impaired mobility or vision – to move about freely from one place to another.

Footpaths and dimensions

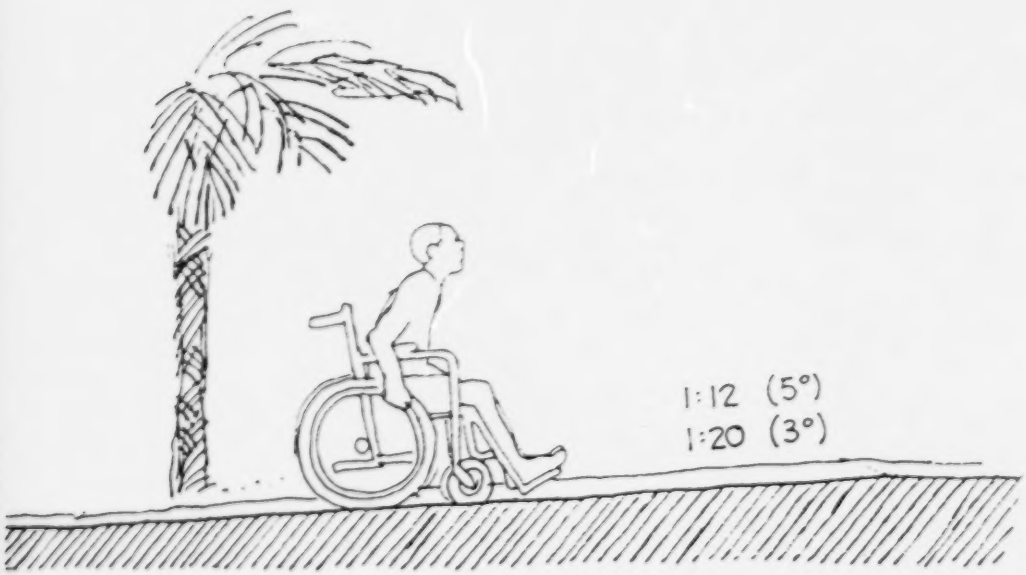
To enable two wheel-chair users to pass on a footpath, an unobstructed width of 1.80 m is required. This width is also recommended as the minimum width of footpaths and walkways.

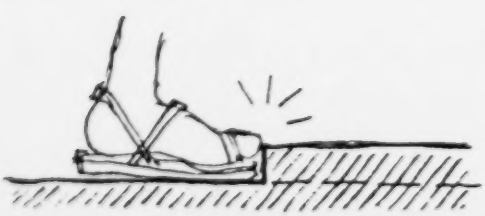
To be effectively usable, footways should be almost level in cross-section, have a firm and even surface, be of adequate width, and not involve undue changes in level.

Gradients

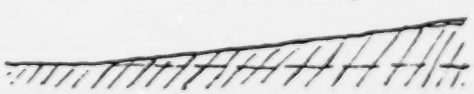
Gradients on footways should not be steeper than 1:20 (approximately 3°) or a maximum of 1:12 (approximately 5°) for short distances. The provision of handrails can be extremely helpful for disabled persons (se RAMPS).

Long slopes should be divided into stages by incorporating level resting areas at approximately 50 m intervals.



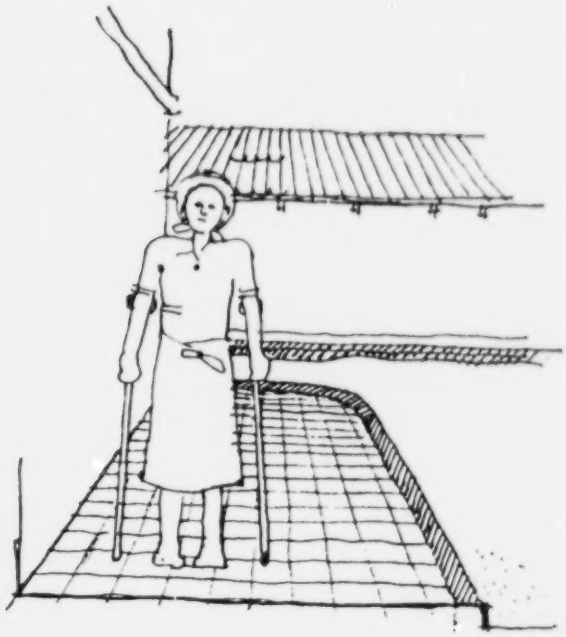


To minimize the risk of stumbling or falling, single isolated steps to take up small differences in levels along footpaths should be avoided. Graded ramps are preferable instead of such steps. An complementary alternative is a ramp built next to the step.



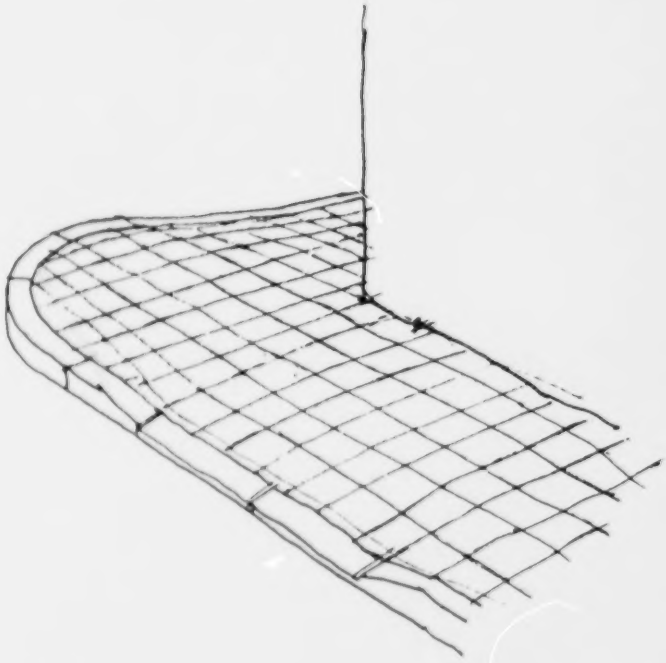
DESIGN RECOMMENDATIONS

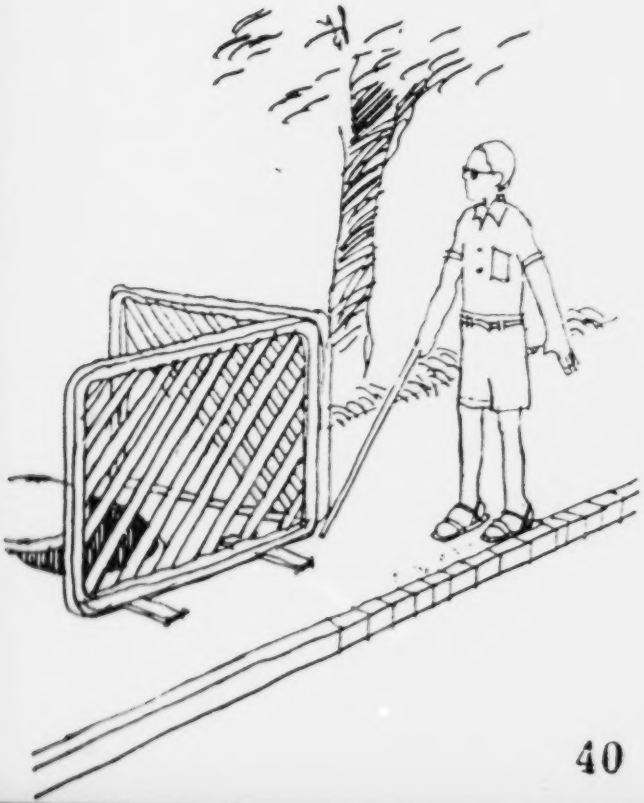
Footpaths and Roads



Surfaces

All footpath surfaces should be firm, even, and slipresistant. If possible, different materials, colours, etc may be used on footpaths to assist recognition and orientation by people with impaired vision.





Kerbs

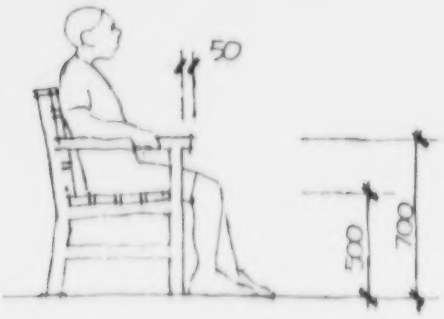
Kerb stones can be used to prevent vehicles from driving up onto pavements and causing an unexpected obstacle. At points where footpaths are specifically designed to cross heavily used roads, kerb stones should be avoided or dropped kerbs used with a maximum height of about 40 mm, which is sufficient for blind persons to recognize the pavement.

Obstacles

All unnecessary obstacles should naturally be avoided. At temporary obstacles (such as road works, etc) secure arrangements must be made to minimize the risk of people injuring themselves. Such arrangements should include warning signs, barriers, and lighting. A person with impaired vision must be able to register the presence of the obstacle with his stick in good time.

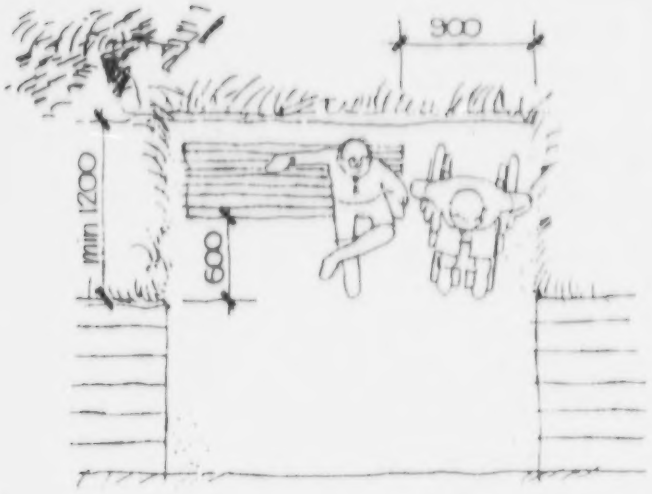
DESIGN RECOMMENDATIONS

Street Furniture



The term "Street furniture" embraces a wide range of components in the outdoor environment including bus stops, benches, and sofas, post boxes, lamp-posts, signboards, telephone cubicles, public toilets, newspaper kiosks, and planting tubs.

Street furniture should generally be placed where it is likely to be required, and accessible from, but without intruding into the pedestrian network. Location of street furniture should always allow free passage and the safe use of site amenities.



Resting Facilities

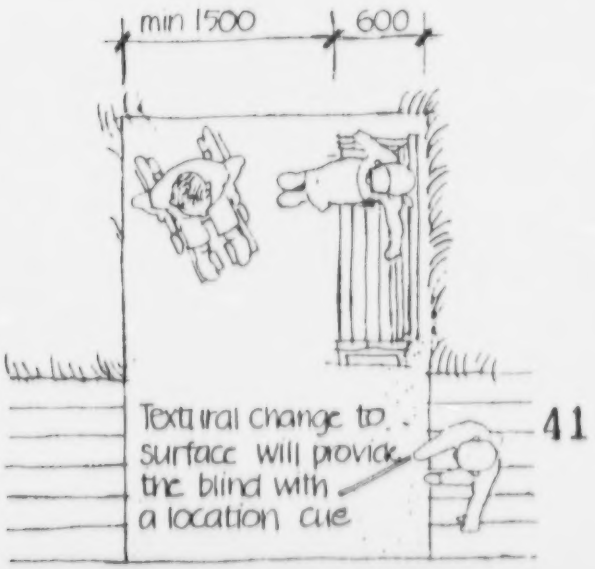
To assist the aged and the disabled, resting facilities at central points, bus stops, and stations are recommended.

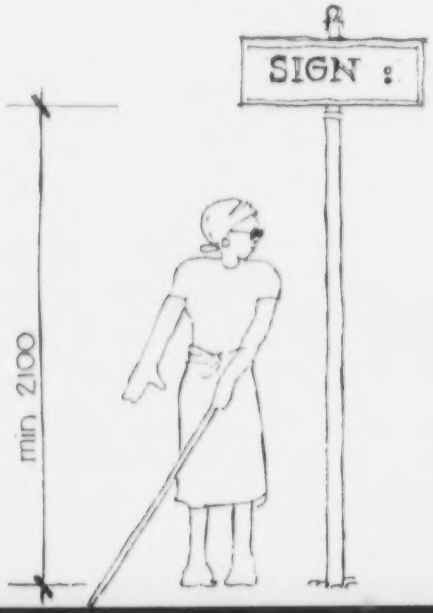
Seats of benches and chairs should be approximately 450 mm above floor level to make them easy to use for ambulant disabled persons. Benches and chairs should have armrests at approximately 700 mm above floor level.

The position of rest benches should be indicated in the footpath surface by the use of a different surface treatment which can be felt with the foot.

Signs

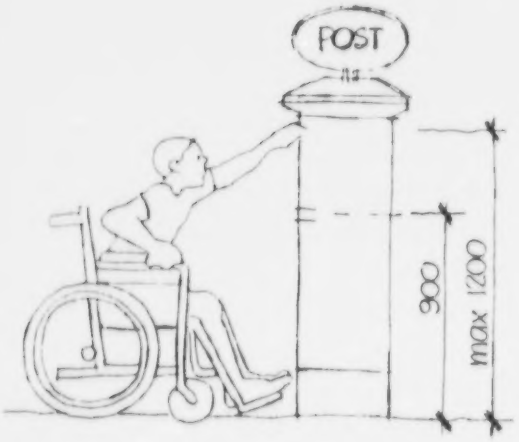
Signboards should have a text with letters at least 30 mm high to allow for reading at normal walking distance. For further details, see SIGNS.





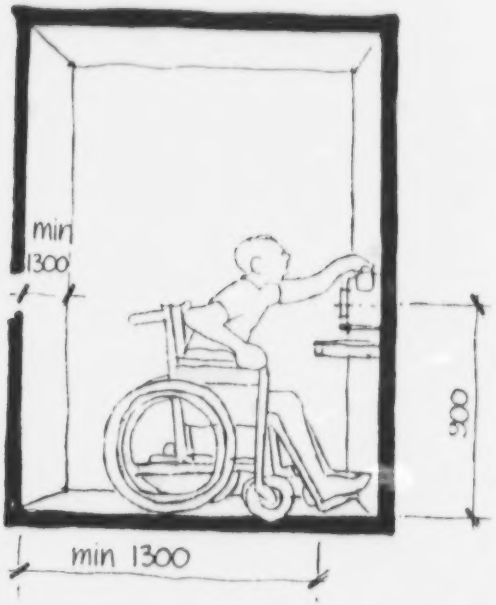
DESIGN RECOMMENDATIONS

Street Furniture



Letter boxes

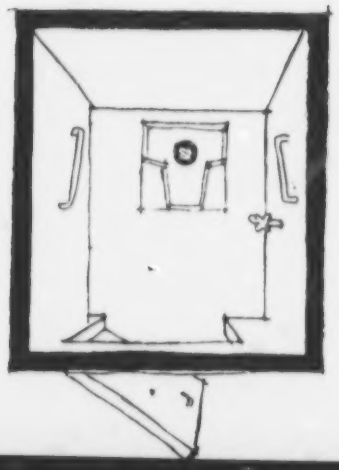
Letter boxes should be mounted with the letter slot approximately 900 mm above the floor for comfortable reach by wheel-chaired persons. However in most cases, the height 1 200 m, will be accepted.



Telephones

Telephones for disabled persons should be placed so that noise from surrounding areas does not cause undue disturbance. The minimum depth under the telephone counter should be 600 mm. The outer part of the counter should be designed as a handrail.

In front of the telephone counter there should be a minimum unobstructed floor area of not less than 1,300 × 1,300 mm.



Toilets

Public toilets should have a minimum dimension of 1.70 × 1.70 m. Where squatting type toilets are used, these should have wide enough doors and be equipped with secure fitted grab rails. A water tap, reachable from the toilet, should always be provided.

Other items

Lampposts should be located so as not to interfere with footpaths or pedestrian walkways.

The use of planting strips allows street furniture to be located outside the limits of the pedestrian footpath system.

Pedestrian gates and turnsiles should meet the requirements as specified in ENTRANCES.

DESIGN RECOMMENDATIONS

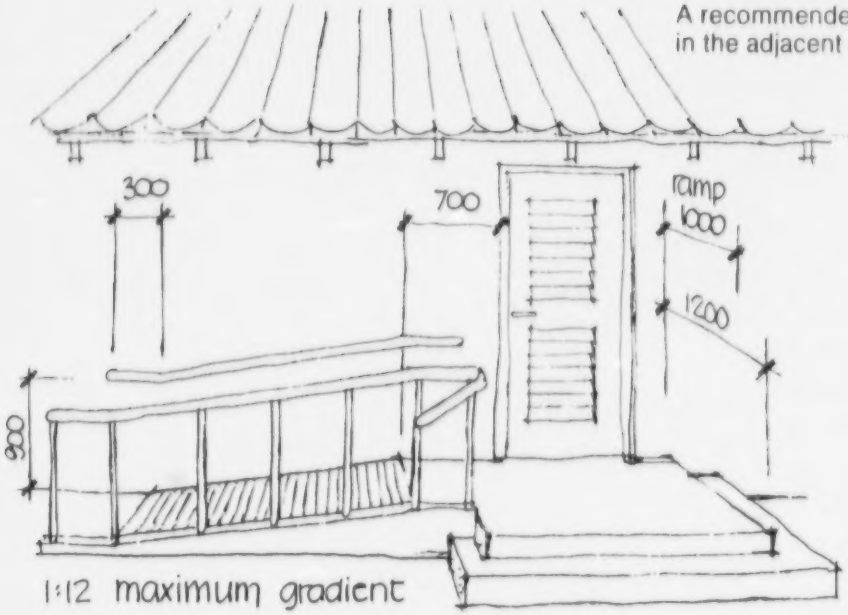
Entrances

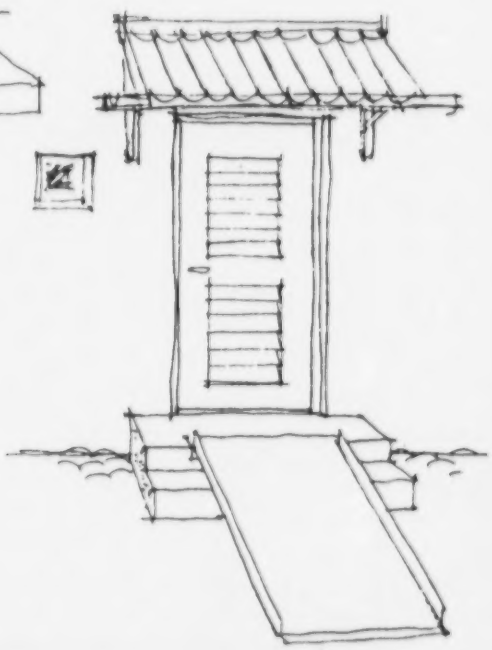
Main entrances should be clearly recognizable, easy to open and simple to pass through. An inappropriate entrance of wrong dimensions may exclude many people, or make it difficult for others to enter the building without assistance.

Differences between external ground and internal floor levels should be avoided as far as possible.

Where different levels are necessary, the entrance (or in buildings with many entrances at least one entrance) should be designed with a ramp complete with handrails along both sides. This will ensure good accessibility for people with impaired mobility. Steps should be provided in addition to a ramp. Door thresholds higher than 20 mm should be avoided. Thresholds should be in a contrasting colour to the floor.

A recommended design of an entrance area is shown in the adjacent sketch.

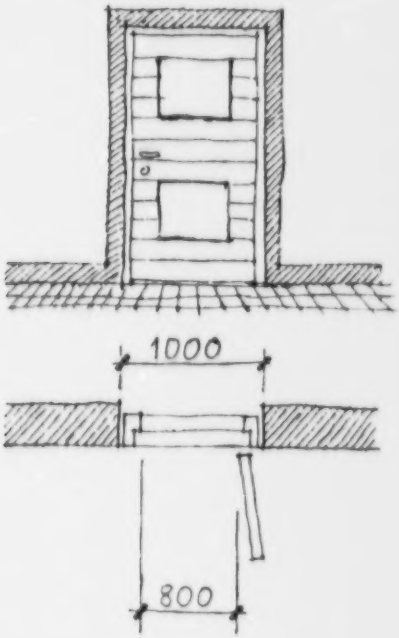




For occasional or temporary use, a portable ramp with a more simple design may be used.

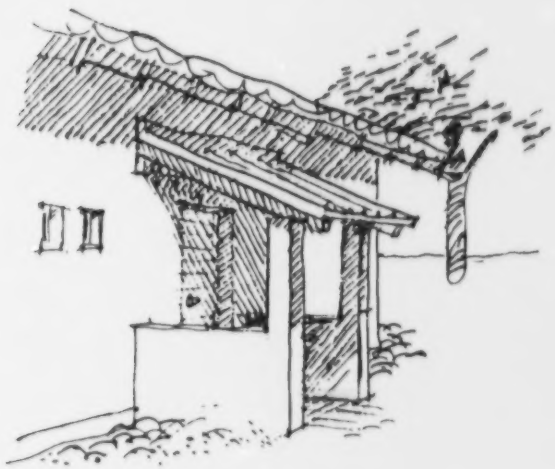
DESIGN RECOMMENDATIONS

Entrances



Entrance doors should have a structural opening of 1.00 m. Entrance doors which are not constantly open during visiting hours should preferably be glazed, but not lower than 0.30 m above floor level. A pull handle is recommended.

To facilitate identification of entrances for people with impaired vision, the door or door frame should be painted in a contrasting colour to the adjoining wall.

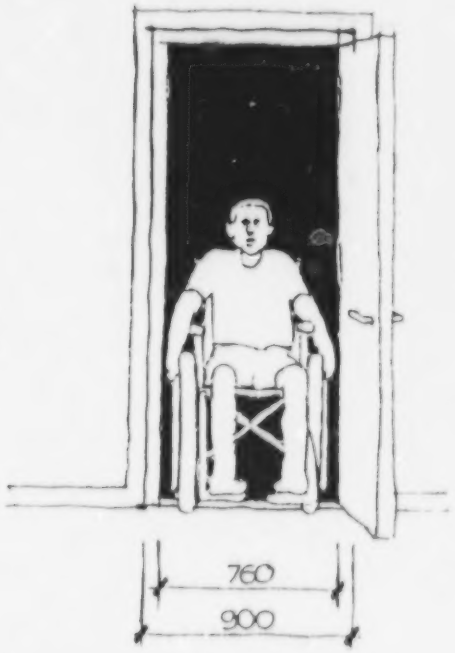


Canopies, porches, or other arrangements can make it easier to identify the entrance from the rest of the building.

DESIGN RECOMMENDATIONS

Doors

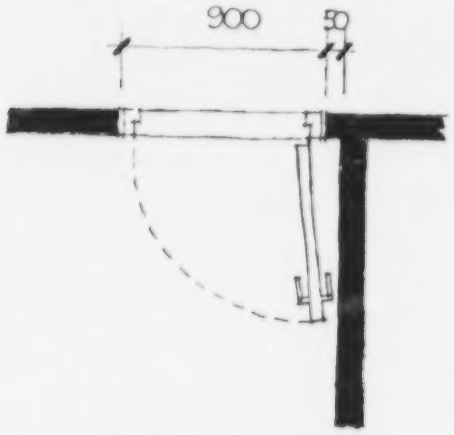
The design of doors and the space associated with them determines whether a room is accessible to wheel-chair users and others with impaired movement.



Door width

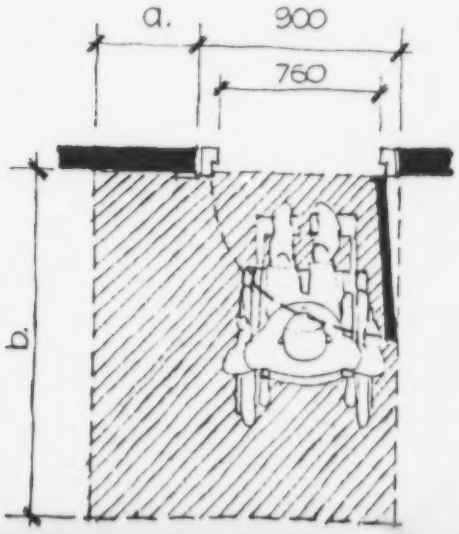
To enable wheel-chair users to pass through a doorway, the minimum width should be 760 mm, i e a 9M door. M is the modular unit of 100 mm.

Doors placed in or close to the corner of a room should be hung with the hinges nearest the corner.



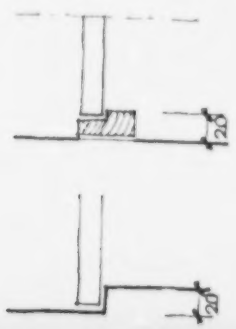
Wheel-chair manoeuvring space

In order for wheel-chair users to approach doors, adequate manoeuvring space is needed. If the door is unduly heavy (e g an entrance or self-closing door) there must be sufficient space for the entire wheel-chair to park beside the door. In restricted spaces sliding doors may be preferable if these are not too heavy.



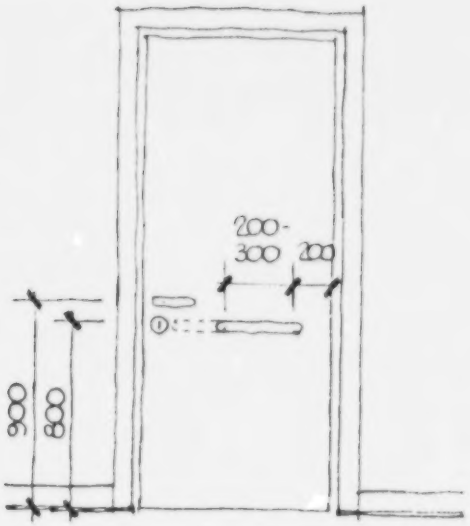
Door details

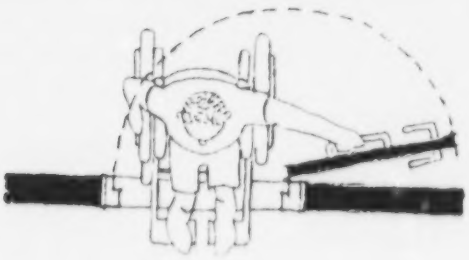
To facilitate the use of wheel-chairs, thresholds should be omitted wherever possible, or have a maximum height of 20 mm. In some situations a pneumatic rubber threshold may be an alternative to ordinary thresholds.



DESIGN RECOMMENDATIONS

Doors





Door handles and locks should be easy to manipulate. To facilitate the closing of doors by people confined to wheel-chairs (for example in a WC compartment), the door handle should be mounted approximately 800–900 mm above floor level to permit easy manoeuvring from both sitting and standing positions. A door fitted with spring closers should be equipped with an easily gripped vertically-mounted pull handle with a length of at least 300 mm, and with the lower end approximately 800 mm above floor level. For many people, and especially those with seeing and/or moving difficulties, it is helpful to make clear whether doors are to be pulled or pushed.

Locks on entrance doors should be mounted not higher than 1.0 m above floor level.

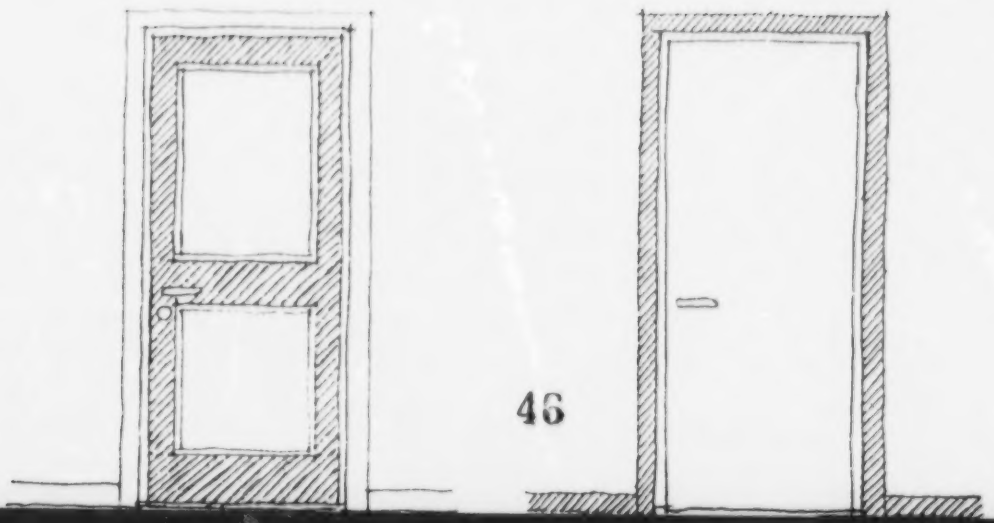
Entrance doors to public buildings should preferably be equipped with pull handles.

Door identification

To facilitate identification of doors for people with impaired vision, the door or door frame should be in a contrasting colour to the adjoining wall. Glass or glazed doors should be marked a little below normal eye-level with a coloured band or line.

However, unless specially marked and protected, glazed doors and wall-panels should be avoided in buildings frequented by persons with sight impairment.

Doors fitted with automatic closers should take account of the limited strength and other problems experienced by persons relying on some form of mechanical aid.



DESIGN RECOMMENDATIONS

Ramps

In order to meet the basic needs of accessibility for the disabled, ramps will often be required to take up changes in level.

Persons with difficulties in moving, but who have the opportunity to use wheel-chairs, and persons pushing a trolley or a pram, are dependent on an uninterrupted access. In certain circumstances ambulant disabled people may prefer to use a ramp instead of steps.

Applications

External ramps are usually required in order to reach the entrances to public buildings such as local administrative centres, health centres, schools, and offices.

Ramps are also frequently used for linking together different building units, following covered ways or open concrete paths.

Internal ramps may be required to take up minor changes in level. To take up larger differences in level, such as between two floors, lifts are usually the only alternative.

Ramps connecting different floors of a building will occupy considerable space.

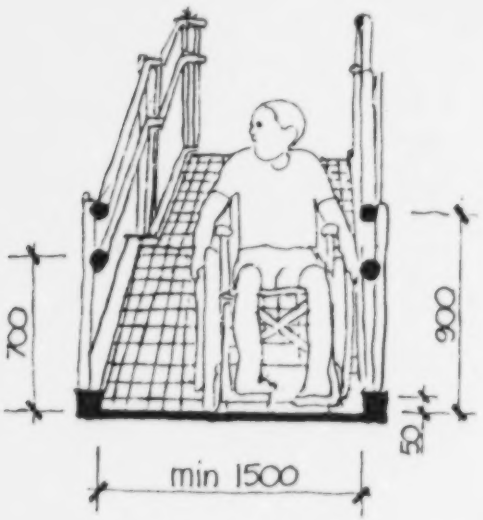
Steps or stairs should in addition to ramps, also be provided to reach elevated entrance floors (see ENTRANCE).

DESIGN RECOMMENDATIONS

Ramps

Recommended ramp gradients:

	length of ramp		
	0–3 m	3–6 m	more than 6 m
ambulant disabled people	1:9	1:12	1:12
independent wheel-chair users	1:10	1:16	1:20
wheel-chairs pushed by attendants	1:9	1:12	1:20



Ramp gradient

For general purposes a ramp gradient of 1:20 is preferred. The maximum gradient should not exceed 1:12, but for practical purposes a steeper gradient of 1:8, or even 1:6, can be accepted as a better solution than no ramp at all.

Ramp length

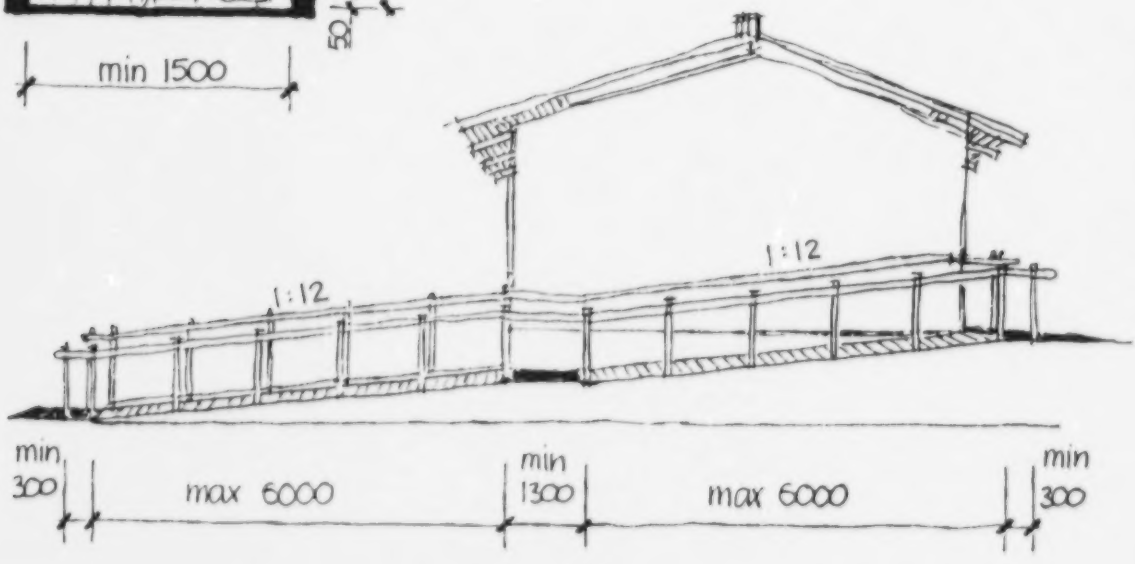
The length of ramps should not exceed 6 m if the gradient is 1:12. When longer ramps are required, they should be separated by landings with a minimum length of 1.5 m.

A level area of not less than 1.8 m should always be provided at the top and bottom of any ramp.

Ramp design

To minimize accident risks to wheel-chair users, ramps should be equipped with kerbs (approximately 50 mm high) on exposed edges.

For ambulant disabled people, ramps should be provided with handrails on both sides (see HANDRAILS), and floor surfaces should be firm, even, and slip-resistant.



DESIGN RECOMMENDATIONS

Staircases and Steps

In many buildings stairways are the only means of moving between floors. A badly designed stairway can impair the possibilities for many persons to reach floors other than the entrance floor. It is therefore important that stairways are designed in a manner that allows their use by disabled people.

Stairways can be divided into three different types:

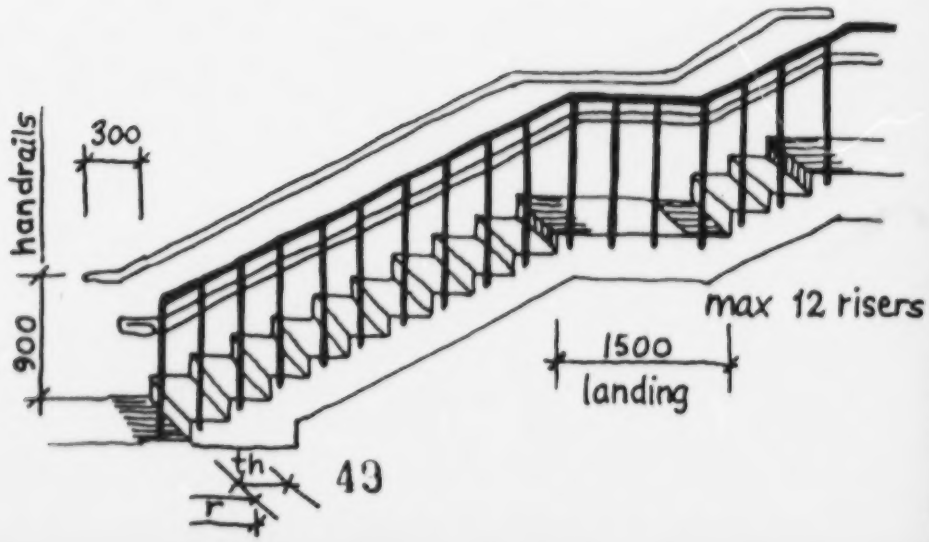
- stairways in institutional buildings
- common stairways serving two or more dwellings,
- stairways within dwellings.
- stairways outdoors

Different requirements apply to each type of stairway (see adjacent table).

Recommended stairway dimensions

	width of stair-way in metres	**size of threads and risers in metres**
stairways in institutional buildings	1.20	th = 0.30 r = 0.15
common stairways serving two or more dwellings	1.00	th = min 0.25 r = max 0.18
stairways within dwellings	0.80	th = min 0.22 r = max 0.22
stairways outdoors	1.30	th = min 0.30 r = max 0.15

The maximum number of risers per flight of steps should be limited to 12. Where longer staircases are needed, a landing should be used. The landing should have the same width as the adjoining stairway.



DESIGN RECOMMENDATIONS

Staircases and Steps

Projecting step nosings and open stairs should be avoided in order to minimize the risk of stumbling. Open stairs are also hazardous for elderly people and others prone to dizziness.

Tread surfaces should be of a non-slip material, and carpets should be securely fixed.

The recommended dimensions for a common stairway in a block of flats are shown in the adjacent sketch.

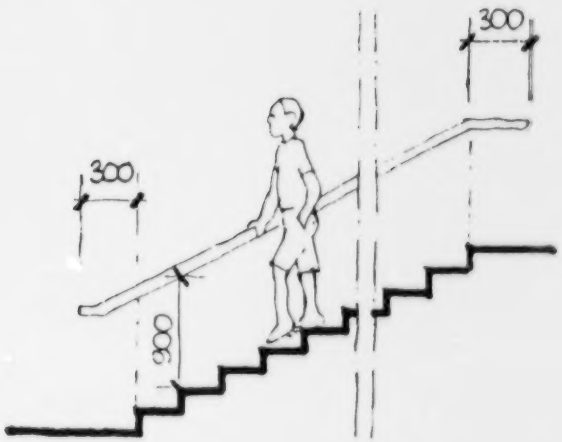
Small changes in level should be avoided. Where they are unavoidable graded ramps are preferable to steps.

Handrails should always be provided on both sides of any stairway. To facilitate use by disabled persons, the rail should be continuous and extend not less than 300 mm beyond the top and bottom step. It should be avoided that handrails protrude into a free area. (For detailed information on the designing of the handrail, see HANDRAILS.)

To assist people with impaired vision, there should be a contrast in colour between landings and the top and bottom steps of a staircase. In addition, the front edge of each step should be in a contrasting colour.

DESIGN RECOMMENDATIONS

Handrails

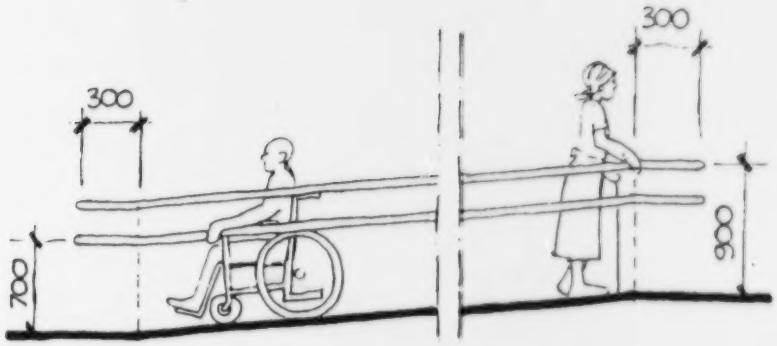


To assist people with impaired mobility, grab rails should be fitted whenever they are likely to assist disabled persons, for example alongside baths and WCs.

Grab rails are also essential at the entrances to buses or trains.

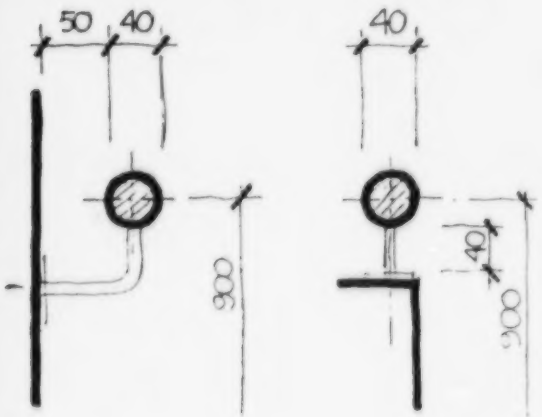
For some disabled persons, climbing a narrow stairway (say 0.7 m) will be possible if handrails are securely fitted on both sides of the stair.

Handrails should always be securely fitted to the wall and the ends of handrails should turn in towards the wall at both ends and not protrude in the free space.



DESIGN RECOMMENDATIONS

Handrails



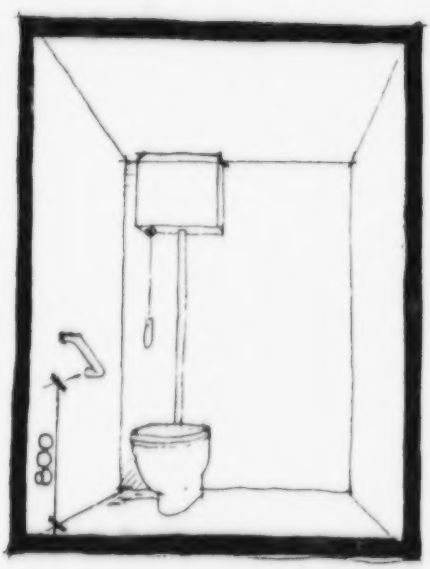
A handrail should be easy to grip, and preferably have a circular section with a diameter of approximately 40 mm.

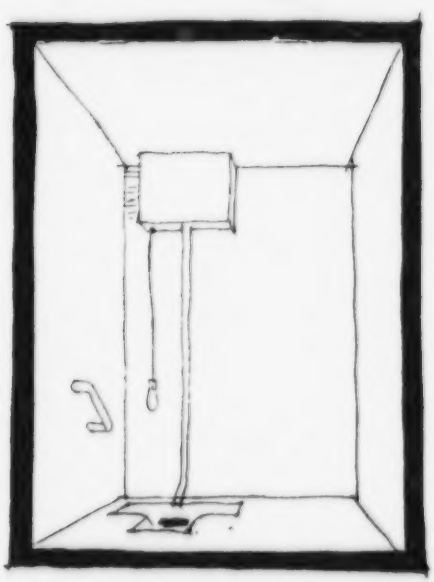
A number of alternative cross-sections are also suitable.

To aid identification, handrails should be painted in a contrasting colour to the wall behind.

Horizontal handrails in circulation areas or on ramps should be mounted approximately 900 mm above floor level to facilitate use by ambulant persons. To facilitate use by people confined to wheel-chairs, a mounting height of 700 mm above floor level is suitable.

Grab rails mounted around the walls in toilet facilities with squatting type closets are a help to disabled persons.





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DESIGN RECOMMENDATIONS

Windows

Windows are primarily incorporated into a building for ventilation purposes and to let daylight into individual rooms. The placing and design of windows will determine how satisfactory daylighting conditions will be in each room. This effects the possibility by persons with impaired vision to orientate themselves, and to identify persons and things in a room. The location and relative height of windows is also important so that wheel-chair users can look out of and open windows.

Window furniture should be chosen with particular regard to the problems associated with opening and closing.

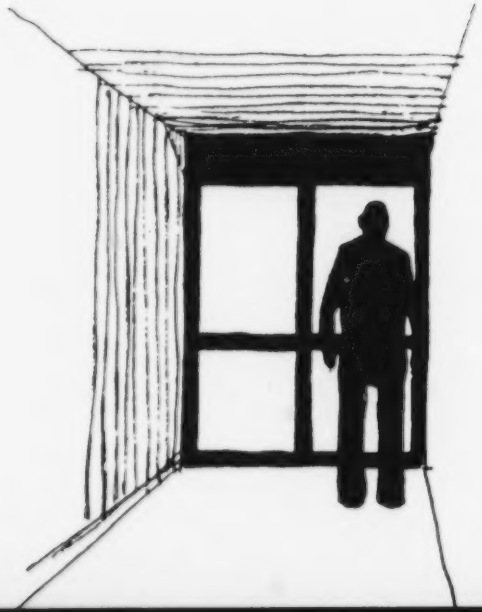
Placing of windows

Windows should be placed so as to avoid glare which can be a problem for people with impaired vision.

Large windows should be avoided at the ends of corridors. Excessive contrast in lighting should also be avoided if pale wall colours are used beside the window or supplementary artificial lighting is employed.

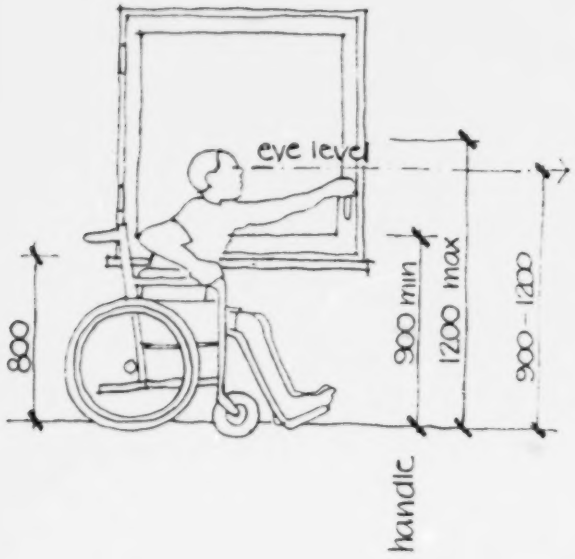
Large glazed areas adjacent to circulation spaces may be marked with a coloured band or line a little below normal eye level.

It is recommended that each window unit should have a maximum width of 0.6 m and be sidehung for easy opening.



DESIGN RECOMMENDATIONS

Windows



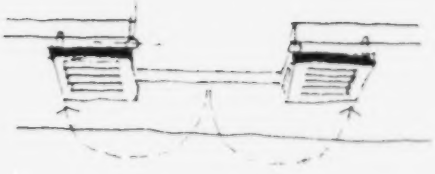
Window positioning height

To enable persons confined to wheel-chairs to look out through windows, the sill should not be higher than 800 mm above floor level.

Handles (Controls)

Windows should be easy to open and close. To facilitate this, controls should be located in a zone between 900 mm and 1,200 mm above floor level.

To minimize the risk for allergies from skin contact with chrome and nickel these materials should be avoided in the window controls.

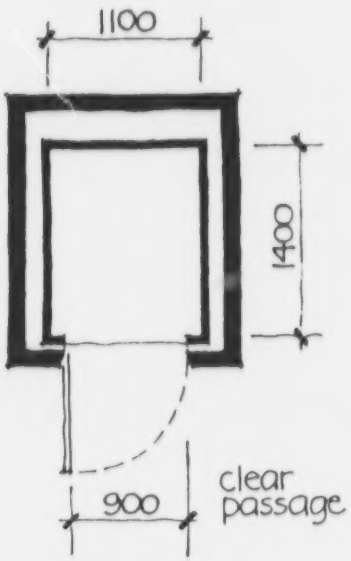


Shutters

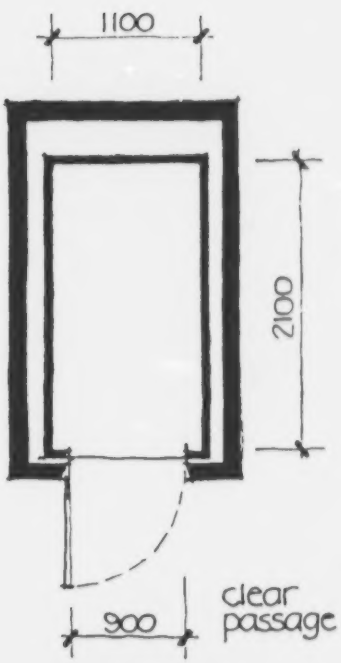
Shutters should be designed so that they can always be fastened securely and flush with the wall, irrespective of whether they are in the open or closed position.

DESIGN RECOMMENDATIONS

Lifts



passenger lift



goods lift

Lifts are often the only possible way for many people to reach by themselves the various floors in a building other than the entrance floor. In buildings accommodating public facilities on the upper floors, lifts are essential to give disabled persons access. Access is necessary in order that disabled persons can be employed.

Location of lifts

The lift or lifts should be located near the main entrance of a building and be clearly marked. The lift should ascend to each floor at a central point from where it is possible to easily orientate oneself. It should be possible to reach the lift at every floor without having to go up or down steps.

Lift-car area

A lift-car should have sufficient space to allow access and operation by persons confined to wheel-chairs. A lift of the dimensions shown in the adjacent diagram fulfils these requirements. However, the minimum width of 800 mm for liftdoors may be accepted in accordance with ISO specifications, although a width of 900 mm is preferred.

For dimensions regarding the unobstructed area in front of manually operated lift doors and for the proper design of lift doors, see DOORS. For lifts with automatic doors, the unobstructed space may be reduced.

In high-rise or commercial buildings a larger goods lift may be installed. This lift may provide an alternative or a complement to the smaller passenger lift(s).

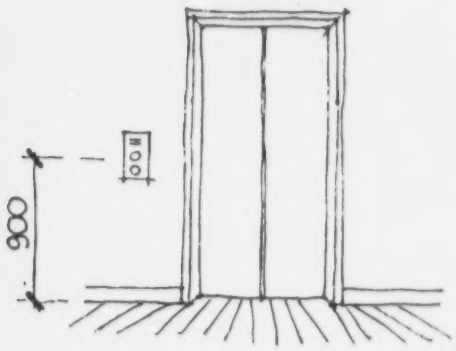
Signs and Controls

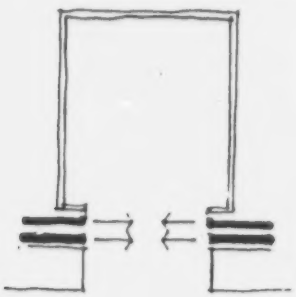
Signs and lift controls should be placed so that they are easy to reach and use (see SIGNS). They should be placed at a level which is also reachable both by short people and persons confined to wheel-chairs.

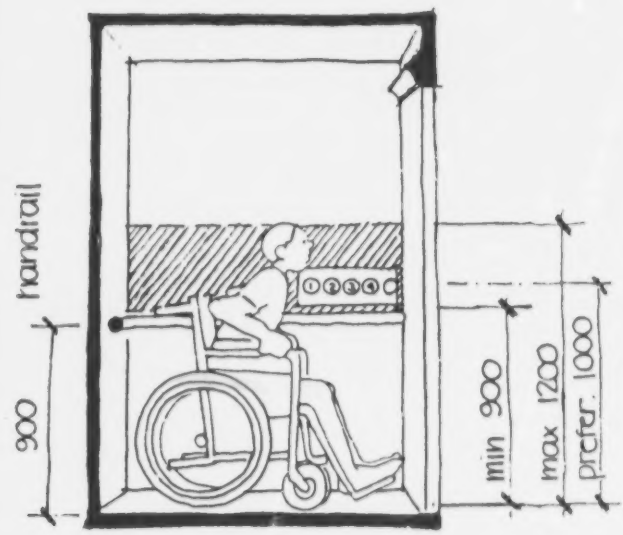
These lift dimensions and criteria are also appropriate for bed and stretcher transport in hospitals.

DESIGN RECOMMENDATIONS

Lifts







Control panels should be mounted centrally in the lift-cars – minimum 25 mm from adjoining wall.

Lift-cars with automatic sliding doors should be equipped with a floor indicator over doorway.

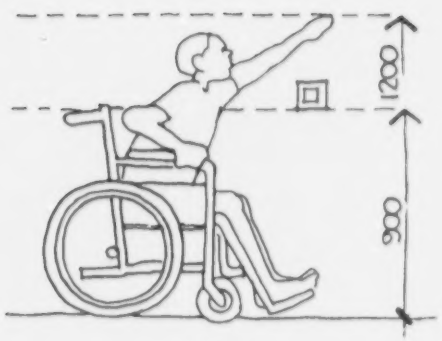
Lift-cars with a simple hinged door should indicate the floor on the inside of the door in raised lettering mounted 1.40–1.60 m above the floor.

The destination button for the principal pedestrian level should be of a different colour and shape (for example black on light colours, or protruding an extra 5 mm).

DESIGN RECOMMENDATIONS

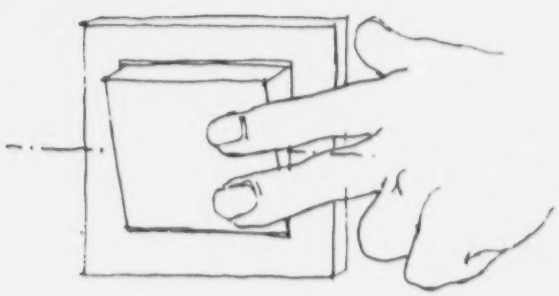
Sanitary and Electrical Controls

The location and design of all switches and controls is especially important for people with impaired mobility and/or vision. Control buttons in lifts, bell pushes, telephones, door handles, window catches, washbasin taps, light switches, and similar controls shall be so designed and located that they can be used by any person. Water taps should be easy to open and close. They should also be located in a way that make them easy to reach and operate.



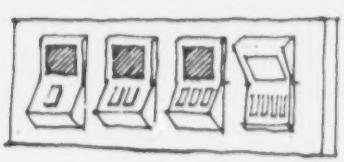
Switches, Controls

Switches, wall sockets and supplementary controls should be positioned so that they are reachable by non-handicapped people irrespective of their height, as well as by disabled persons. To achieve this, controls should be mounted within the recommended height limits, 0.9–1.2 m above floor level. At doors, switches should preferably be at the same height as the door handle and on the adjacent wall to the handle.



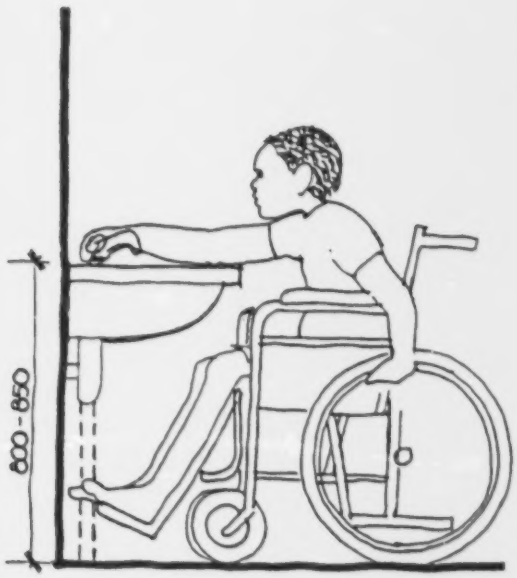
Switches and controls should be large. Controls can sometimes be complemented with embossed symbols to assist people with impaired vision. This method is recommended for buttons in lifts.

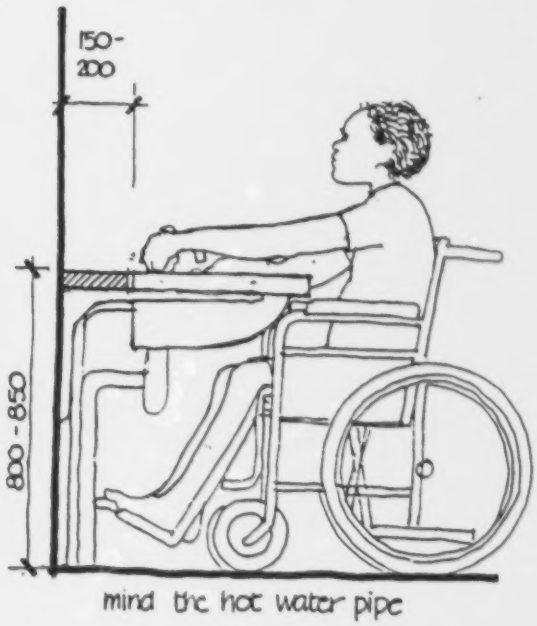
In certain circumstances and at certain special locations, instructions in braille should be considered as a helpful addition.



DESIGN RECOMMENDATIONS

Sanitary and Electrical Controls





Water Closets

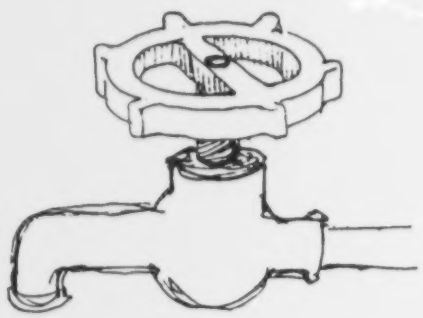
Low-level type toilets and pit latrines should be complemented with vertical grabrails placed at the side and slightly ahead of the toilet.

To facilitate use by disabled persons, WCs should preferably have a seat at 0.5 m above floor level, and grab-rails fixed adjacent to the WC at 0.7 m above floor level. Swing-up supports are often considered to be a practical solution.

Wash-basins

Wash-basins should be located at a height of 800–850 mm above the floor. Where special consideration is to be given to the disabled, the basin may be drawn forward 150–200 mm. Walls and the fixing of wash-basins and supports must be strong enough to cope with the considerable pressure. The foul water outlet should be set back into or through the wall where possible.

There should be a clear space of not less than 35 mm between the tap grip on the wash-basin and any adjacent vertical surface. If two taps are installed, the clear width between them should preferably be at least 200 mm.



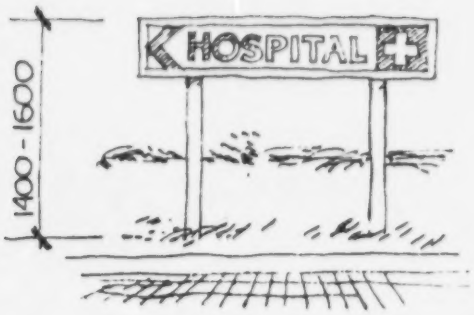
Where two taps are used, the left one should be connected to the hot water supply.

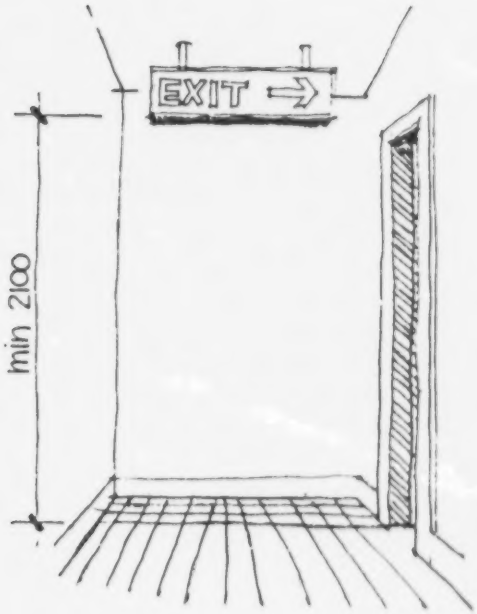
Taps should be easy to grip. Screw-down taps with a broad domed head are suitable.

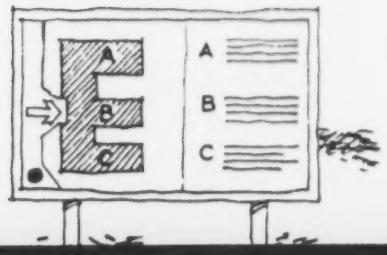
As an alternative, taps where a single lever action controls both temperature and flow of water, may be recommended for certain groups of disabled persons.

DESIGN RECOMMENDATIONS

Signs







Properly located signs of good design is of great importance for people to find their way both in the outdoor environment and in buildings. The design and location are especially important for people with impaired vision and hearing but also for children.

Signs, symbols, and informative texts must be presented in a manner which renders them easy to read and understand. In buildings likely to be visited by persons with seeing difficulties, complementary texts in braille may be used.

Location

Outdoor signposts should generally be placed so that the lower edge of the information symbol is a minimum of 2.1 m above the ground.

Signposts on pedestrian footpaths should be fixed at 1.40–1.60 m above the ground and close to the path.

Indoor location signs and at doorways should be placed on the wall on the same side of the door as the door handle. The height above floor level should be 1.40–1.60 m.

Signs suspended from ceilings in dorridors, etc should allow for clearance of at least 2.1 m.

Signs should always be located in a way that will not cause injury. If they intrude on circulation areas, the clearance above the floor should be at least 2.10 m.

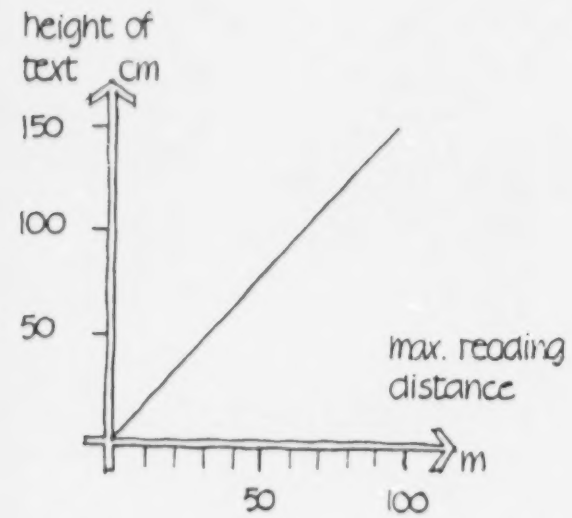
A signboard at the entrance to a building complex with an orientation map of the building is a helpful guide for all visitors. Such orientation maps though, must be clear and easy to understand. It is also helpful if the position of the signboard is marked on the map, and the map repeated at various points around the building.

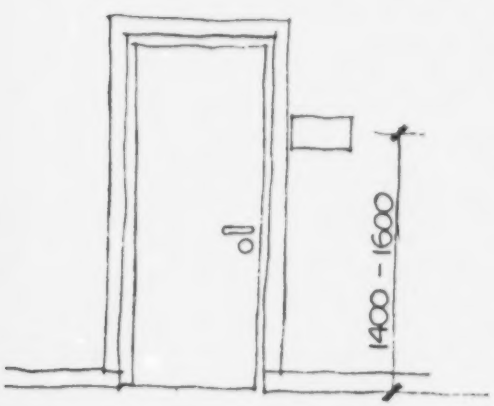
Lettering on signs and instruction boards shall be clearly legible and embossed or in braille to allow reading by persons with seeing difficulties.

The shape of a signboard should also respect the information it is designed to convey.

DESIGN RECOMMENDATIONS

Signs





A rectangular signboard should give "information".
A triangular signboard should indicate a "warning".
A circular signboard should indicate a "prohibition".

The text on signboards should be of such dimensions that people with a visual acuity of more than 6/60 which is normal sight should be able to read it at the intended distance.

The size of capital letters as a relation of the reading distance is shown in the adjacent diagram.

The vertical components of letters should have a thickness which is 1/5 of the height of the letter.

Door name-plates should be fixed to the wall on the opening side of the door. Text and symbols may be mixed within the same sign or sign layout.

Informative text and symbols should contrast with the background. Special colours should be used for different purposes.

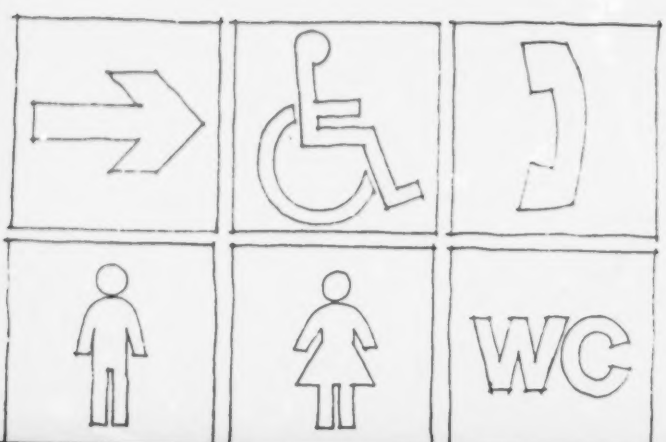
"Green" on a signboard should indicate "clear".
"Red" should indicate "not clear".
"Yellow" should indicate a "risk".

yellow	red	green
risk	emergency	safety
· warning · projecting objects · mobile part of a machine	· flamable material · emergency stop · stop-sign	· emergency exit · first aid

Letters and symbols should preferably be raised from the background (at least 1 mm) in order to enable blind presons to "read" the information using the tips of their fingers. Engraved letters are simplier to produce and are also accepted. The size of the letters should be at least 15 mm to enable tactile reading.

Pictograms

The adjacent pictograms are internationally known.



DESIGN RECOMMENDATIONS

Certain Areas

Spatial requirements for rooms, waiting areas and passageways should be based on human dimensions, space utilization, furniture, equipment, and the expected type of occupancy. Dimensional criteria for some functional areas are given below.

The size of rooms as well as the layout of furniture should pay special heed to the needs of disabled persons. Consideration should be given to circulation space between pieces of furniture. However well rooms are planned and designed to take account of accessibility by disabled persons, the functional efficiency of rooms is dependent upon the design, size, and layout of the interior furnishings and fittings.

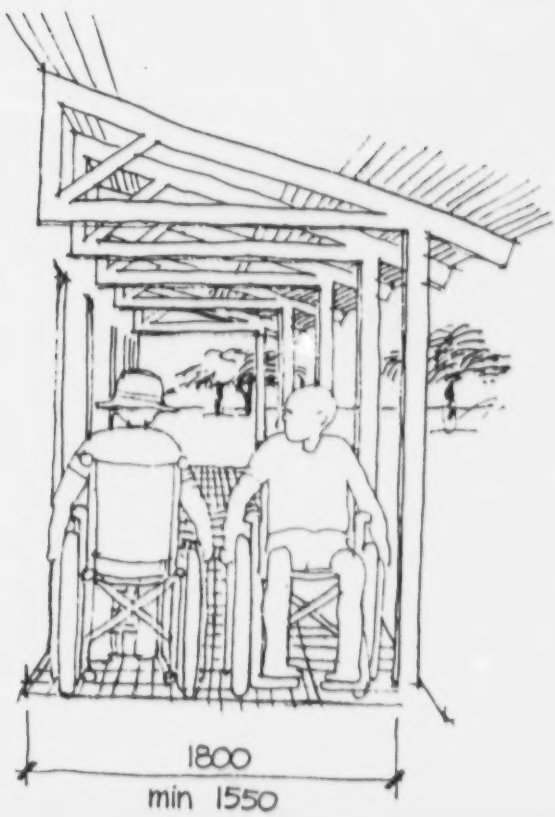
Passageways

Internal passageways should have a minimum clear width of 1.50 m. Doors, information signs, cupboards, benches, etc should not encroach on this minimum clearance. Passing places with a minimum width of 1.95 m should be provided at least every ten metres where frequent pedestrian flow can be expected. At supermarket checkouts, gates to public transport facilities, etc, there should be at least one with a width of minimum 0.85 m.

Internal corridor widths should not be less than 1.50 m. The minimum clear width which allows a walking person to meet and pass a person in a wheel-chair is 1.20 m. However, provision must also be made to allow for the movement of stretchers or furniture through doorways out into the corridor.

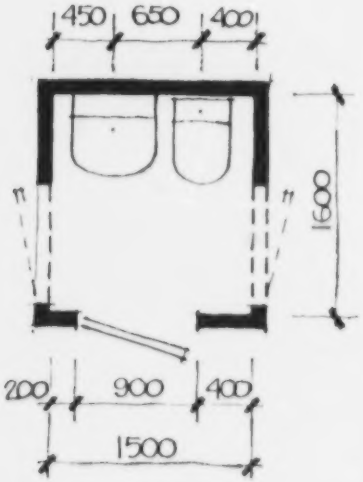
The common arrangement in the tropics with verandahs along the outside of buildings, which are used for both communications and for waiting and sitting, must be taken account of. This is especially the case at many health centres in developing regions where patients and visitors are waiting in corridors and on verandah communication areas. To ensure smooth pedestrian flows in such areas, the width should not be less than 1.80 m.

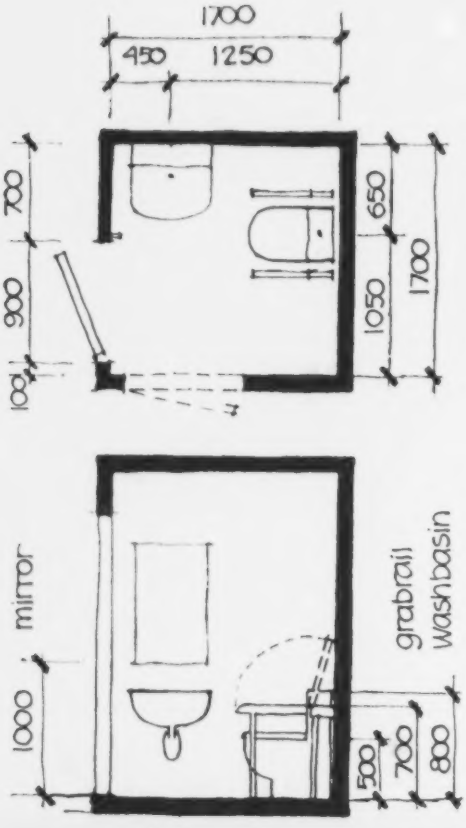
If corridor lengths must be excessive, resting and passing areas should be incorporated at regular intervals of about 30 m along these corridors and pathways, where possible seating should be provided.



DESIGN RECOMMENDATIONS

Certain Areas





Lavatories

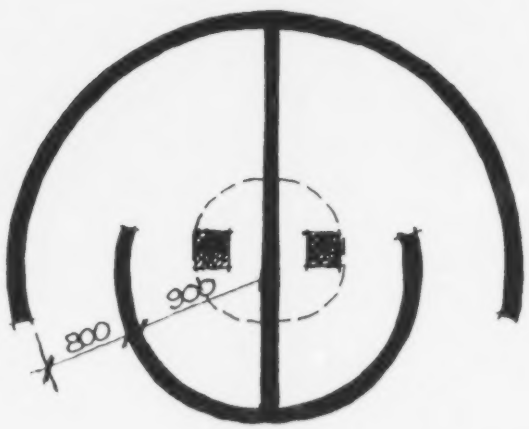
The space requirements for toilets for disabled persons in developing areas should not necessarily be based on the same functional space requirements as for persons confined to wheel-chairs. However, where adequate space for a wheel-chair is provided, there is also likely to be sufficient space for disabled persons using crutches or other technical supports, or for people assisted by a second person. This extra space will also be well suited for mothers with children, who constitute a large proportion of the visitors to many public buildings.

The minimum size of a toilet room for use by disabled persons using an ordinary wheel-chair is 1.70 × 1.70 m with the possible arrangement of sanitary equipment as shown in the adjacent sketch. The washbasin may be located outside the toilet area. It is an advantage, however, if a disabled person can wash his or her hands while seated.

Equipment, such as supporting rails, toilet paper holders, etc should be firmly fixed and reachable from a seated position.

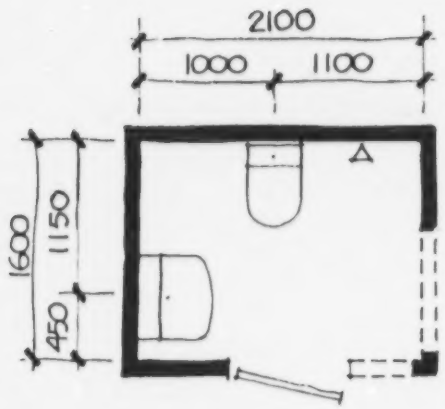
The same dimensions are valid for the more common low-level type of toilet and for simple washing arrangements. However, it should be remembered that physically disabled persons cannot squat. The low type of toilet may therefore not be suitable for use where disabled persons are likely to visit.

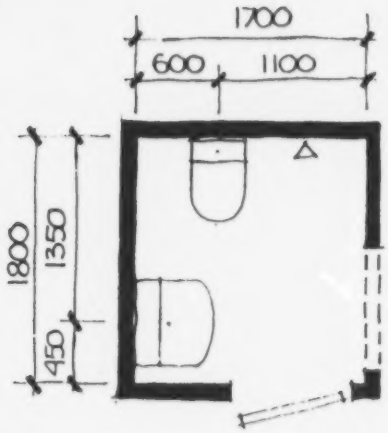
With regard to these criteria the suitability of the common pit latrine for disabled persons may be questioned. However, there is often no alternative. Consequently firm fixed grab rails, suitably placed, will definitely improve the utilization of this type of facility.

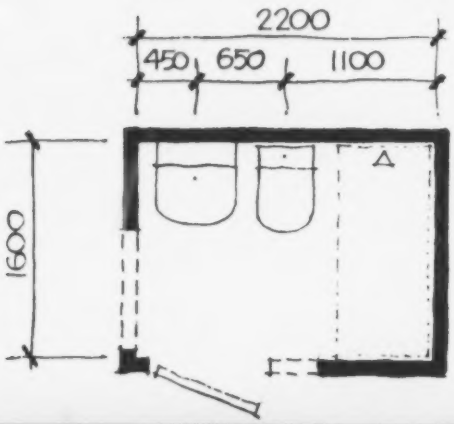


DESIGN RECOMMENDATIONS

Certain Areas







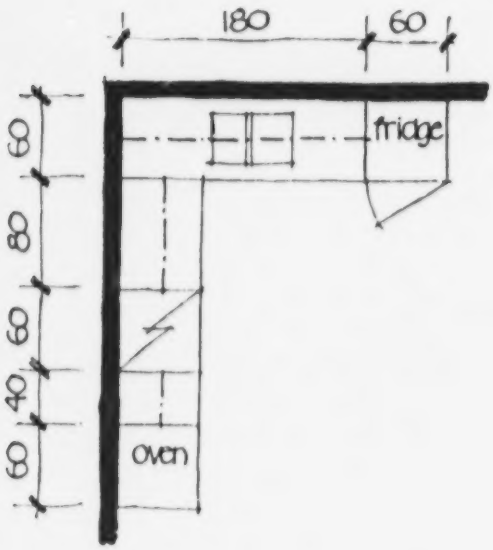
Bathrooms

The same criteria as for toilets should be applicable for bathrooms. Generally, a shower is easier to use than a bath for a person with moving difficulties. It is even possible for a disabled person to take a shower seated on a stool. A space of 0.90 m square is required if the shower is situated beside the WC or a washbasin. If bounded by a wall, bath or other object, the shower space should be increased to 1.00 m square.

The position of taps should be carefully considered. These should be placed so that they can be reached from outside the shower.

DESIGN RECOMMENDATIONS

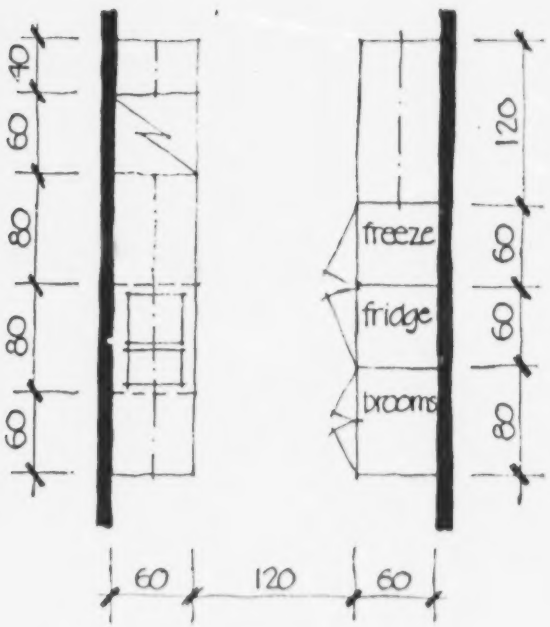
Certain Areas



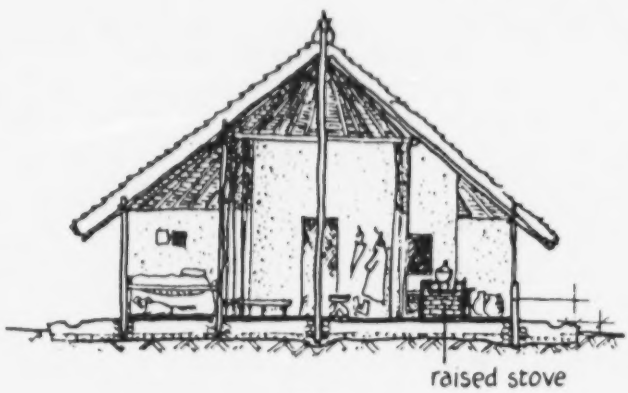
Kitchen

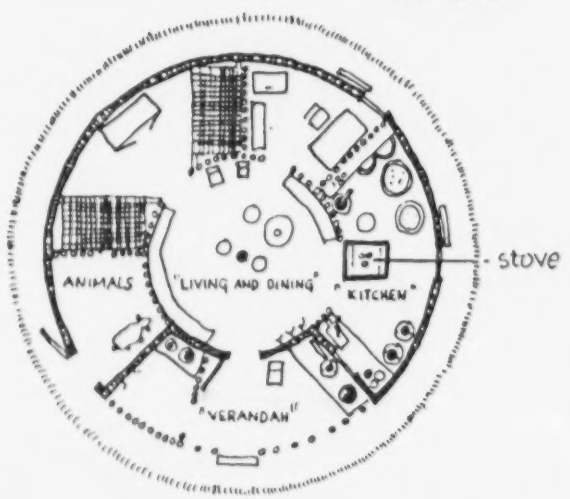
Exemples of fitting arrangements for western type kitchens which are adaptable to wheel-chair users are shown.

Space under worktops should be unobstructed. The dimensions of worktops should be 0.80 × 0.60 m with a height of 0.75–0.85 m above floor level depending on the type of wheel-chair in use. A wheel-chair requires a clear space at least 0.75 m wide at a dining table, and at least 0.50 m deep under it.



The cooking facilities in a traditional house especially in rural areas is usually limited to a simple stove or open fireplace on the floor. Protective arrangements around the fire should be considered in order to avoid burns. Facilities for the escape of smoke should be arranged in order to avoid respiratory and eye problems.


raised stove



6.1

from Rural Housing in Chilalo, Ethiopia by Elisabet Hanson, Cadu Publication 1973

DESIGN RECOMMENDATIONS

Class-rooms

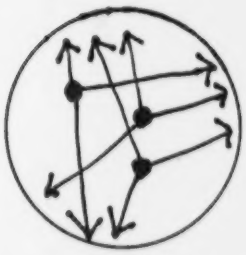
Size and Shape

The design and lay-out of the classroom will support, or restrict, the learning capacity of pupils, in particular those with considerable physical handicap, but also of pupils with modest hearing or seeing difficulties. Ideally, it should not be necessary to single out handicapped pupils by locating their seats in any particular area of the class-room, typically up front.

Pupils with seeing and hearing difficulties are conventionally seated close to the teacher and the blackboard. However, the rear wall might also be used for teaching purposes, and pupils should be able to listen to other pupils.

To achieve minimal average distance from any point to another in a classroom, its shape should be circular.

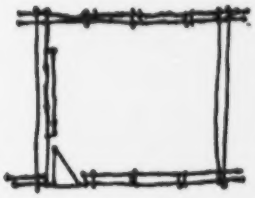
circular is



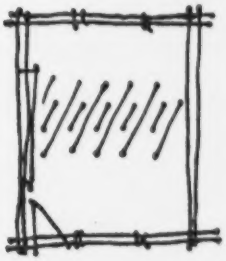
rarely possible

Experience proves however, that this is for other reasons rarely feasible. The second best, and more realistic, room-shape is square, or close to it.

square is good



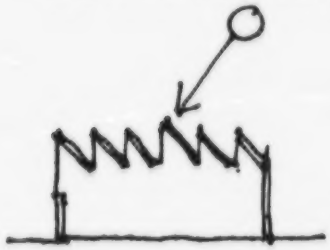
Rectangular classrooms should be avoided. The rectangular classroom, where the teacher is located at one of the shorter walls, will increase hearing and seeing difficulties due to distance. A 'short and wide' classroom, on the other hand, often has problems with natural lighting and reduced cross-



rectangular is less good

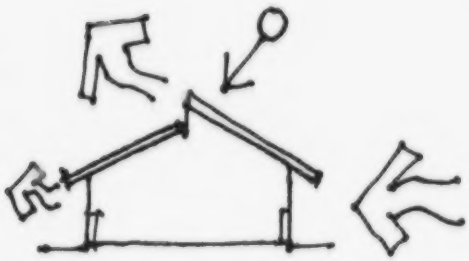
DESIGN RECOMMENDATIONS

Class-rooms



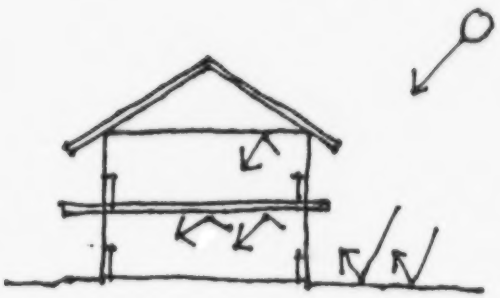
Natural Lighting

Ideally, natural lighting in class-rooms should come from above, through windows oriented and designed to block direct sunlight. The technical solution is the saw-teeth shaped roof conventionally used in industrial buildings.



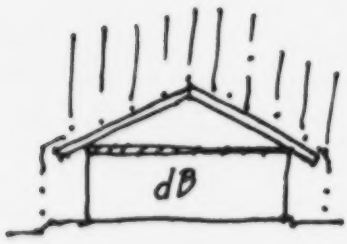
For a number of technical and economical reasons, this design is rarely considered justified for schools. A simplified type, with a single window on the ridge could be used for one-storey buildings. This would enhance natural lighting in the center of the room, and provide for improved natural ventilation. The building must however then be carefully oriented on the actual site, which experience shows might be a problem, if standard designs are employed.

In any case, windows in a facade should be as high as possible, in order to allow light to penetrate into the interior of the class-room. This is enhanced by a light-coloured ceiling.



DESIGN RECOMMENDATIONS

Class-rooms



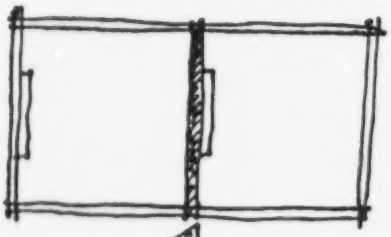
... sound-absorbing ceiling..

Acoustics

The acoustical properties of class-rooms are rarely taken into serious account. This is so, although these properties can be improved by rather simple means.

At least one interior surface should be sound-absorbing, typically the ceiling. This will reduce the echo, and thereby the general noise level, to the benefit of pupils with hearing dificulties, and equally to others. Sheets with this property, made of wood-wool, wood-fibres or gypsum, are available in most countries. The obvious draw-back of such a ceiling is that it will stain and disintegrate if wet. The roofing must be properly designed and maintained. Some softboards might be prone to damage by termites.

A thatched roof without ceiling will theoretically have similar properties, but has other well known disadvantages.



..heavy wall, reaching the roof...

One of these is noise transmitted from an adjacent class-room. This problem is reduced, generally speaking, if partition walls are allowed to reach the roof, and are made of a heavy material.

As for the building envelope, some building materials are known to generate a considerable noise in heavy rain. This is in particular the case with steel-sheet roofing. For reasons of cost and availability, this material might be difficult to avoid, although the negative consequenses for pupils with hearing difficulties should be taken into account.

DESIGN RECOMMENDATIONS

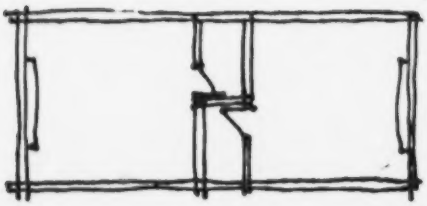
Class-rooms

Lay-out

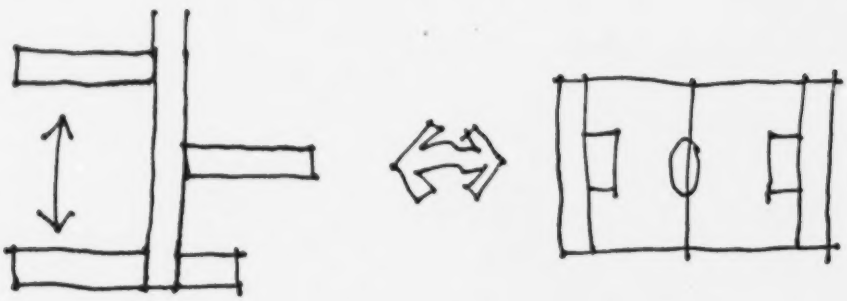
One should further consider the relationship between noisy and quiet rooms in the school building. Music rooms and workshops etc should be located as far away from quieter spaces as possible.

Noise transmission is reduced if a class-room is separated by a non-teaching room, such as a store, from other class-rooms or more noisy rooms.

It is also good advice to consider noise, when the site lay-out is made, so that e.g. the sports-ground, playground, etc, are located away from the class-rooms. Noisy activities on adjacent sites should equally be taken into account.



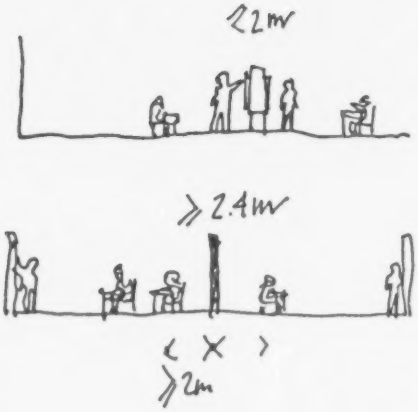
... separated by non-teaching room ...



... noisy activities away from class-rooms ...

DESIGN RECOMMENDATIONS

Class-rooms



Open Hall Schools

From the point of view of noise control, open hall schools constitute a problem of considerable magnitude. There is, e.g in many Asian countries, a long tradition of learning and teaching in large and undivided halls. For pedagogical reasons, open and interlocked lay-outs are preferred, and indeed advocated by many architects and planners. In addition such schools are reported to provide better thermal comfort in many cases, and might also be considerably cheaper.

The implications of noise control in open hall schools have been studied (see reading list), and the recommendations are basically as for conventional class-room schools, although the available design alternatives are more limited.

In addition, two recommendations are given:

* when teachers are teaching 'back to back, the division unit need not be higher than 2 metres

* where teachers are facing the common partition, it should be not less than 2.4 metres high, and pupils should not sit less than 2 metres from the partition.

These recommendations are given for schools for 'normal' pupils. It goes without saying, that those with even only minor hearing difficulties are likely to be considerably more disturbed in open hall schools than in conventional class-rooms.

The crucial issue for a school designer is whether the advantages of an open hall school compensate for the disadvantages for pupils with hearing difficulties.

DESIGN PROPOSALS

In this section, a number of architectural drawings supplied by Unesco, Paris, are copied. Remarks are made on the designs in hand-writing, indicating ways of improving the access of handicapped persons to these buildings.

A more detailed analysis would no doubt generate more ideas. The section seeks primarily to illustrate that it is during the design stage that small and probably inexpensive modifications can generate considerable benefits.

Examples from the following countries are provided:

Cameroun
Central African Republic
Ethiopia
Guyana
Swaziland
Haiti
Ecuador.

REBIA 1972		DATE DEC. 74
TYPE OF SCHOOL Middle	LOCATION Yaounde, Cameroun	COMPILED BY E. Almonte
		LEGEND : SEE INSTRUCTIONS

FINANCING		STUDENT AGES 2 3 4 5 6 7 8 9 10 (11 12 13 14) 15 16 17 18 +		DATE
GOVERNMENT [x]		LENGTH OF STUDIES 1 2 3 (4) 5 6 7 8 9		DESIGNED
BILATERAL* [ ]		YEARS REQUIRED FOR ENTRANCE I II III IV (V) VI VII VIII IX X XI XII		BUILT
INTERNATIONAL* [ ]				OPENED
SELF-FINANCED [ ]	N° OF SHIFTS	ENROLMENT PRINCIPAL SHIFT BOYS GIRLS	NUMBER OF BOARDERS BOYS GIRLS	DESIGN. 480 CAPACITY

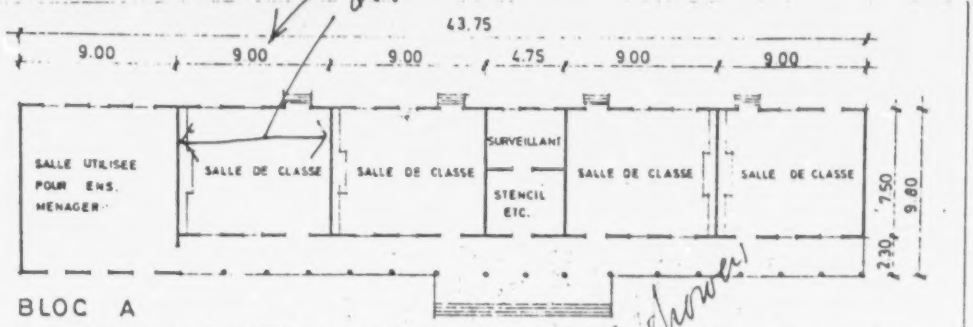
* EXPLAIN:

ARCHITECTURAL DRAWINGS

large classroom seeing & hearing difficult

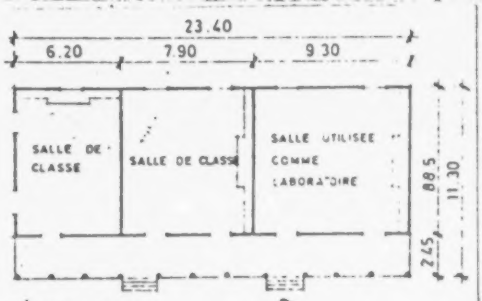
ORIENTATION : SHOW NORTH
Show N° of levels : G + X
G = ground floor. X = N° of levels above

Sketch plan and section : show allocation of spaces and date of construction for each building, marking it A, B, C,.....etc.

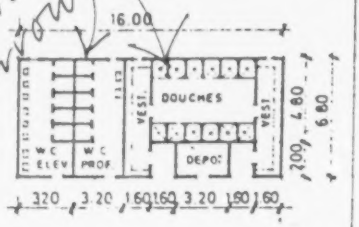


BLOC A

toilets & showers narrow!

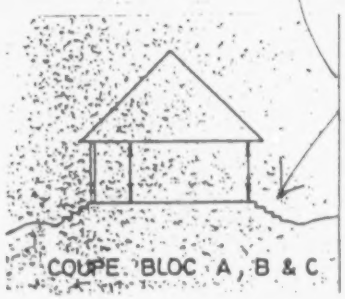


BLOC C

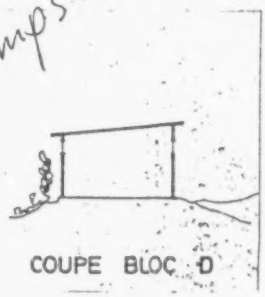


BLOC D

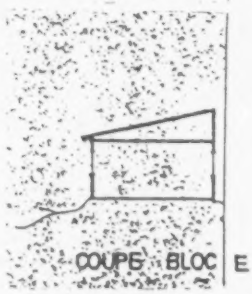
ramps



COUPE BLOC A, B & C



COUPE BLOC D



COUPE BLOC E

Note: Project to be read in conjunction with 125.02.

GRAPHIC SCALE 0 2m.
PLACE THE O WHERE CONVENIENT : BASIC INCREMENT : 5 mm

GRAPHIC CODE — TEACHING SPACES — ADMIN. — SERVICES — CIRCULATION — LODGING & BOARDING

DETECTRI . 62 rue de Bellechasse . 75007-PARIS . 705 50 24 . n°3048 D

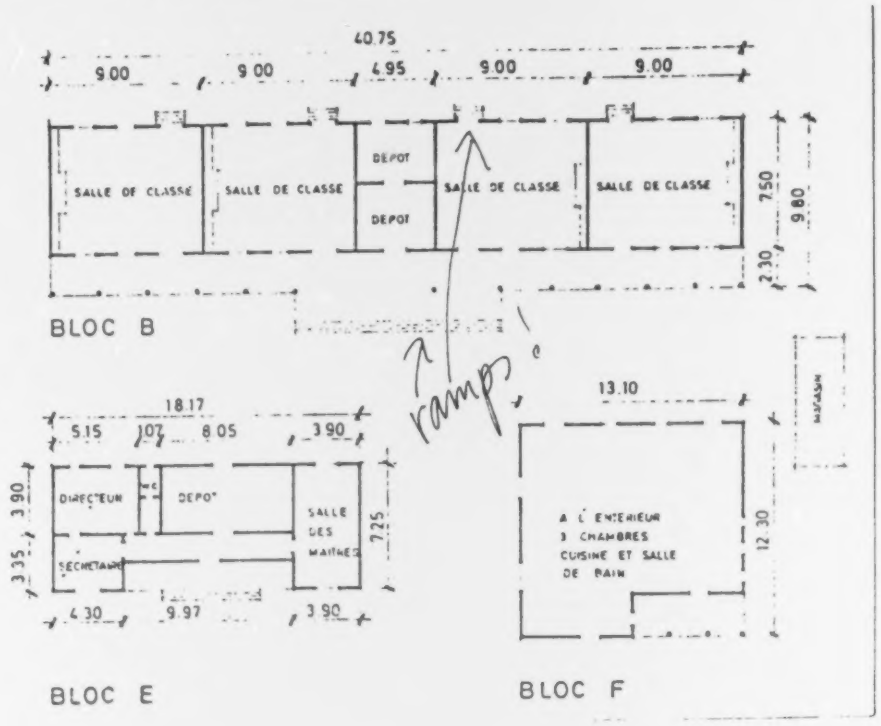
PTO

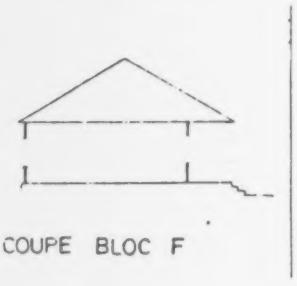
(15) 71

CLIMATIC: IV V VI VII VIII
ROOM TYPE: UNITS TENS HUNDREDS
CARD TYPE: SITE BRIEF DRAWING ROOM

BEST COPY AVAILABLE

ARCHITECTURAL DRAWINGS (continued)





COUPE BLOC F

OUTLINE OF BUILDING MATERIALS

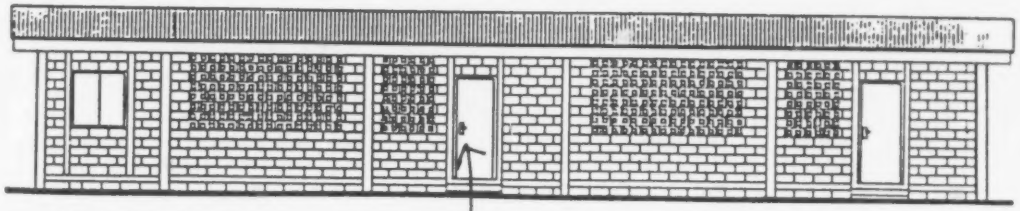
STRUCTURE:

ROOF:

WALLS:

BEST COPY AVAILABLE

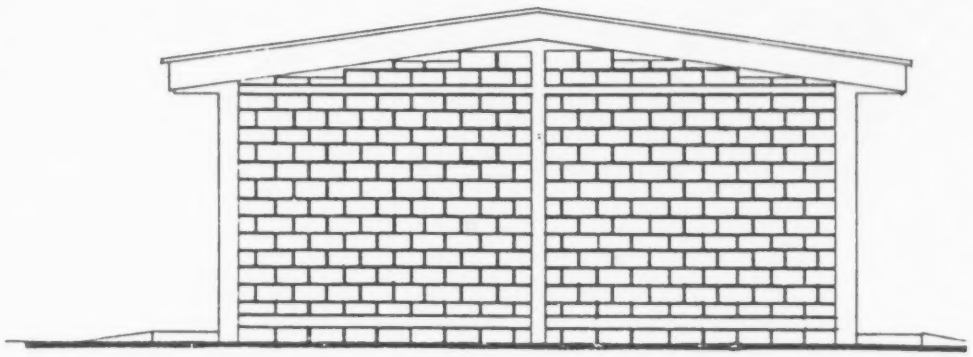
PAYS	REPUBLIQUE CENTRAFRICAINE
PROJET	PROJET EDUCATION R.C.A/FONDS DE L'OPEP POUR LE DEVELOPEMENT INTERNATINAL CAF 706/10



FAÇADE POSTERIEURE

ECHELLE
0 1 2 3

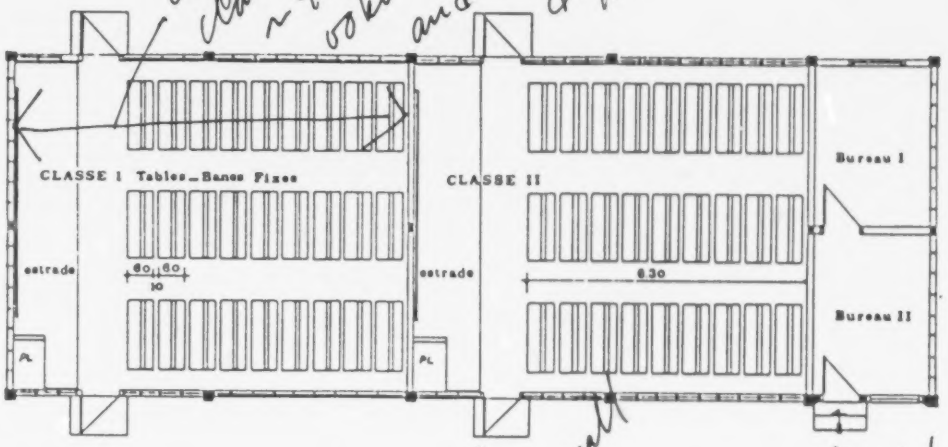
door-handle might be too high. Should be .9 m



FAÇADE LATERALE

ECHELLE
0 1 2

PAYS	REPUBLIQUE CENTRAFRICAINE
PROJET	PROJET EDUCATION RCA/FONDS DE L'OPEP POUR LE DEVELOPEMENT INTERNATINAL CAF 706/10



VUE EN PLAN

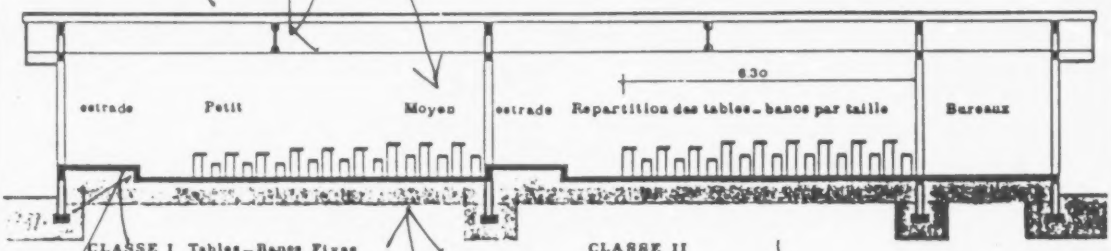
ECHELLE 0 1 2 3

length of classroom ~ 9 m. Pro- oobes hearing and seeing difficulties

Beam/truss might obstruct acoustics = poor hearing in rear of class-room

Landing too small for person in wheel-chair to open door

Ramp needed (1:12)



COUPE LONGITUDINALE

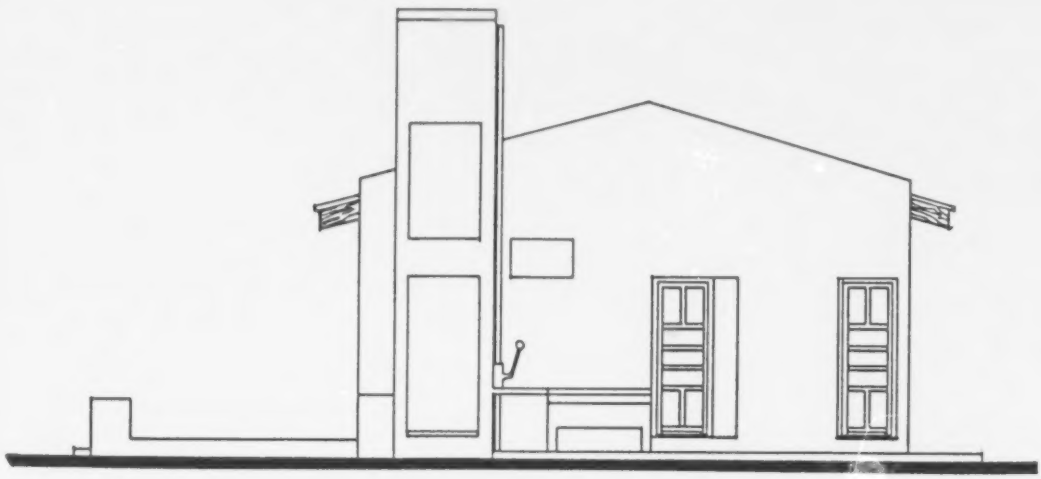
ECHELLE 0 1 2 3

plat-form to be avoided or equipped with ramp (1:12)

fixed furniture is not convenient for those with moving difficulties

BEST COPY AVAILABLE

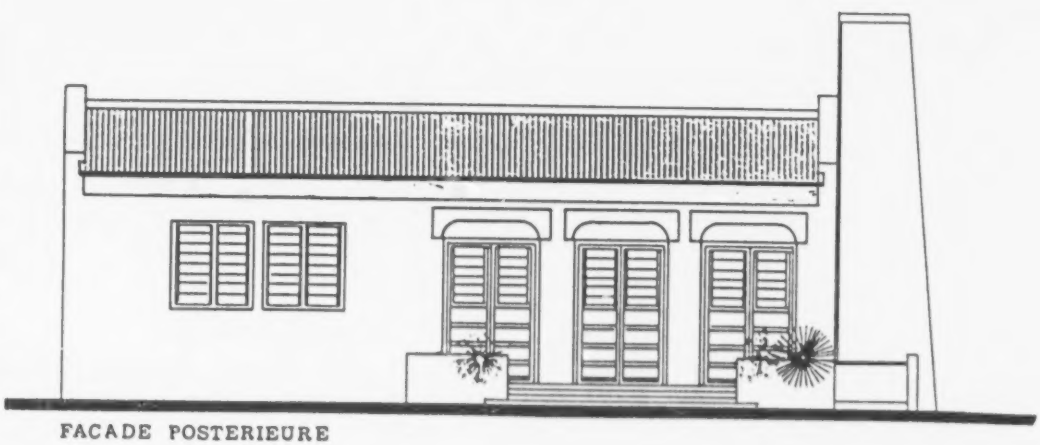
PAYS	REPUBLIQUE CENTRAFRICAINE
PROJET	LOGEMENT AMELIORE CAF 706/10



FAÇADE OUEST

echelle

1 2

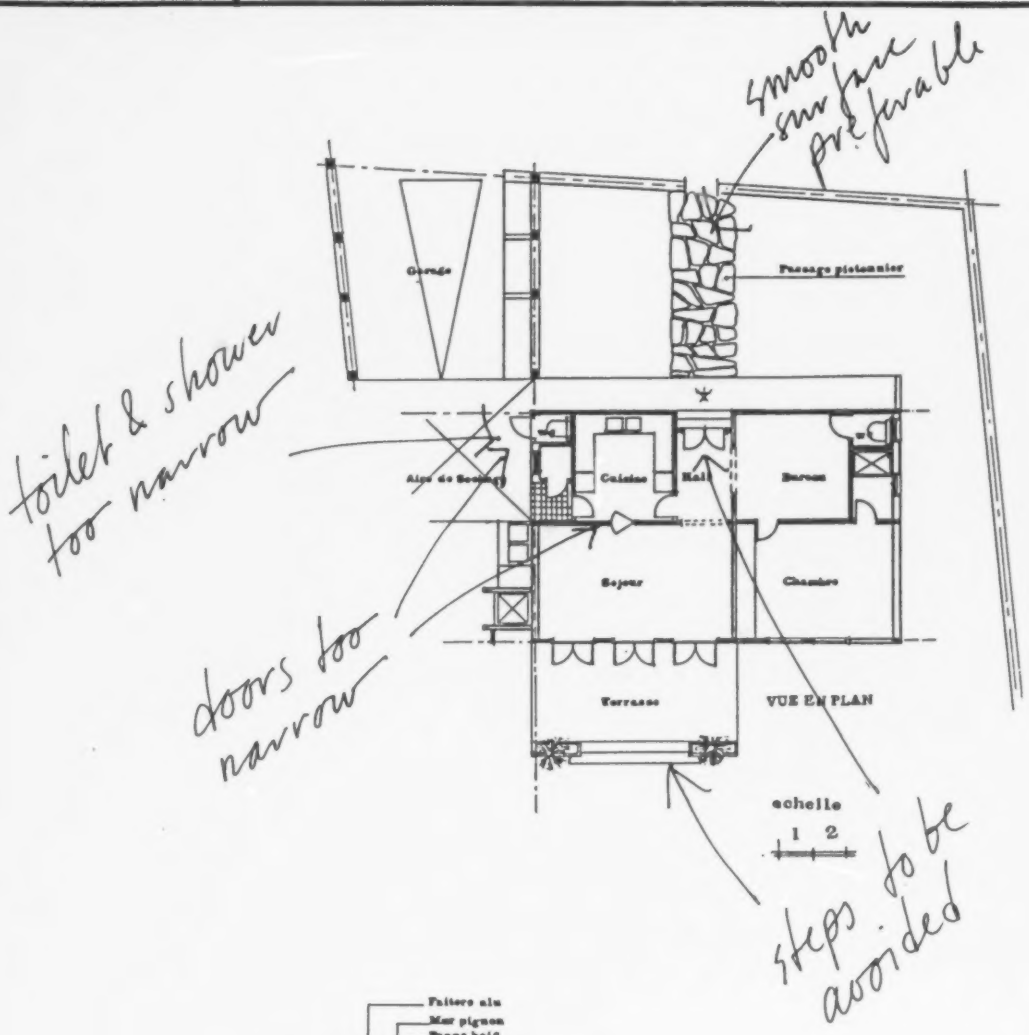


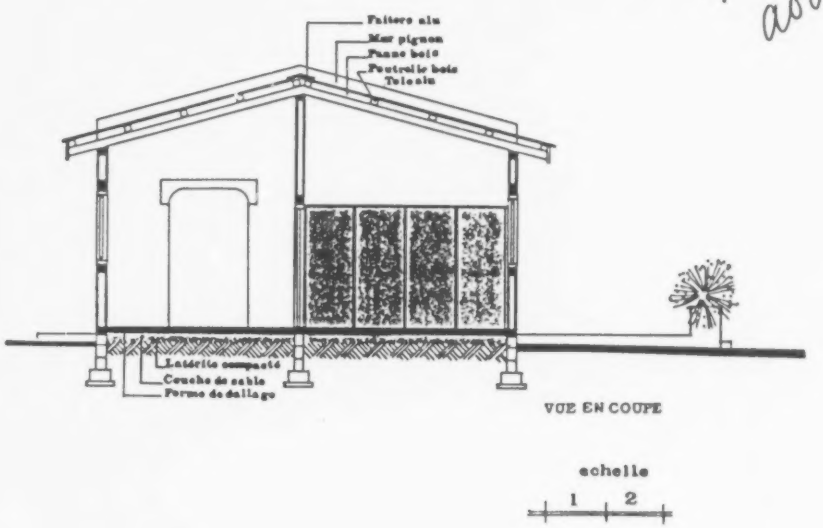
FACADE POSTERIEURE

echelle

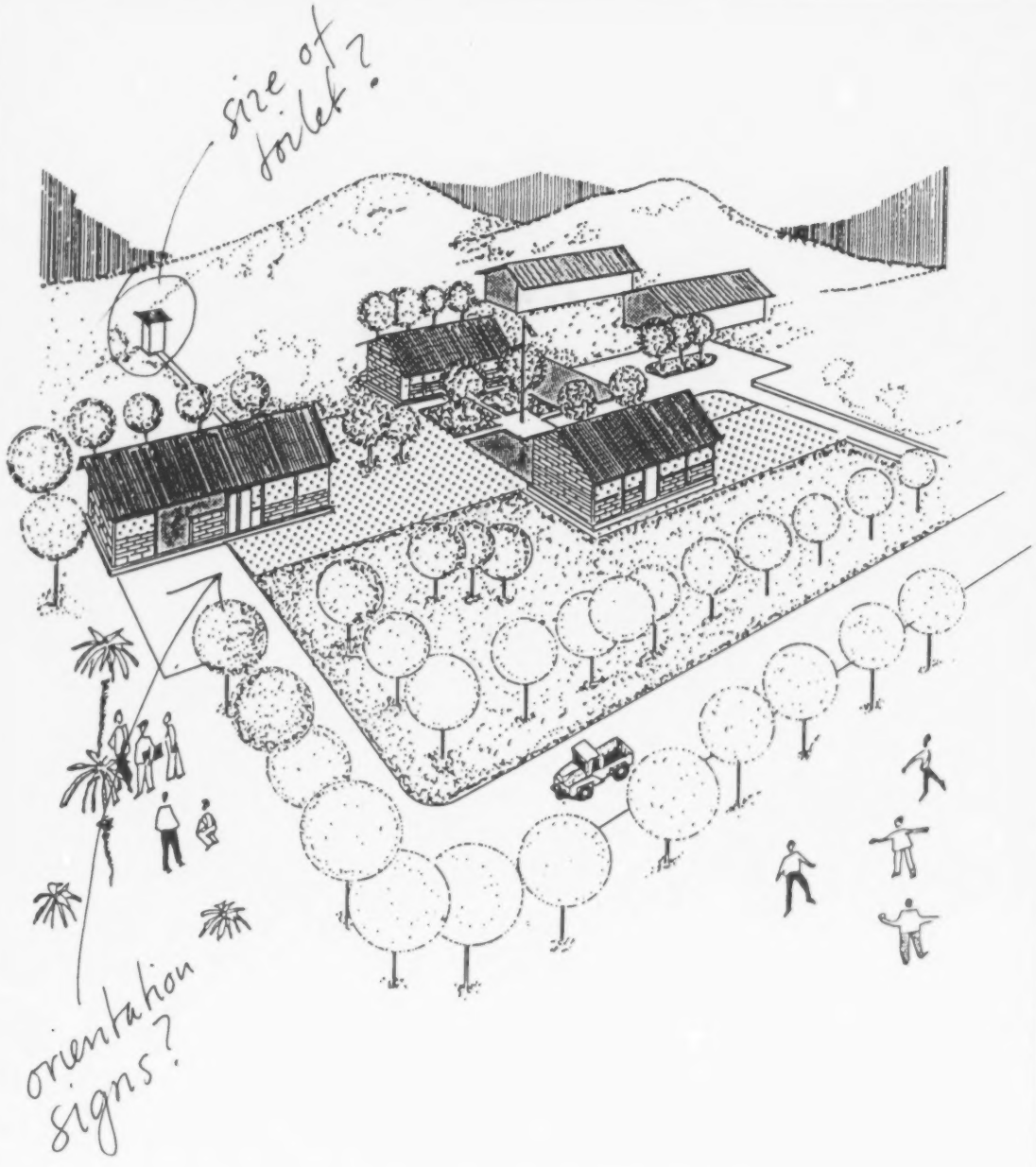
1 2

PAYS	REPUBLIQUE CENTRAFRICAINE
PROJET	LOGEMENT AMELIORE CAF 706/10



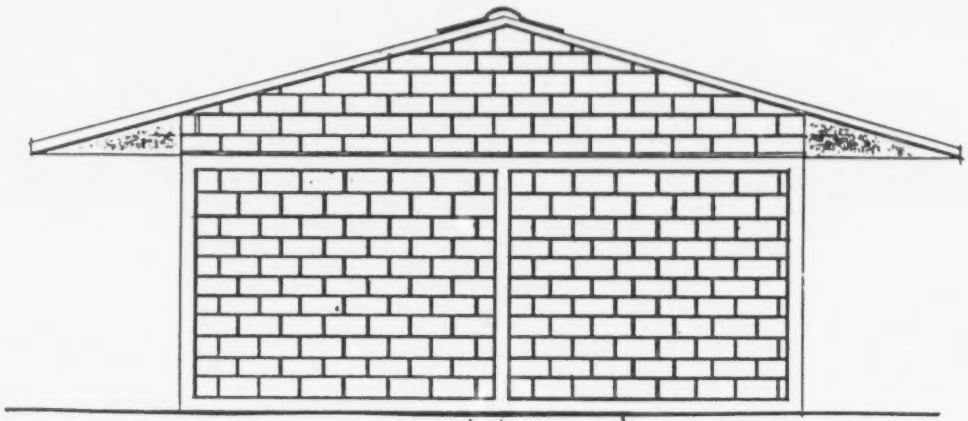


PAYS	ETHIOPIA
PROJET	SCHOOL_BLOCKI_OPEC 706 ETH 10



PERSPECTIVE_BASIC
EDUCATION CENTER

PAYS	ETHIOPIA
PROJET	SCHOOL - BLOCKI - OPEC 706 ETH 10

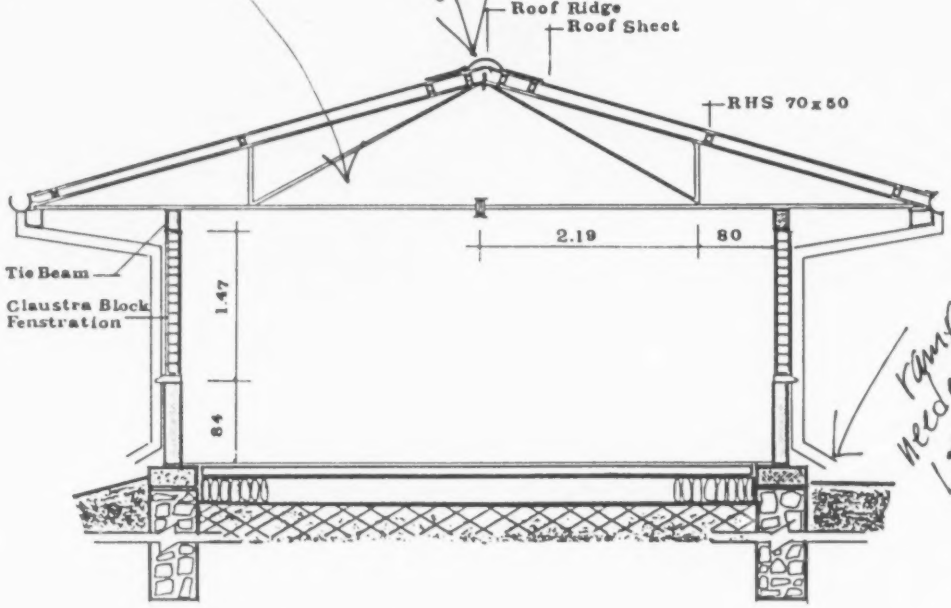


acoustics may be poor

acrylic roof ridge (used in Ethiopia) improves light in centre of room

GABLE SIDE

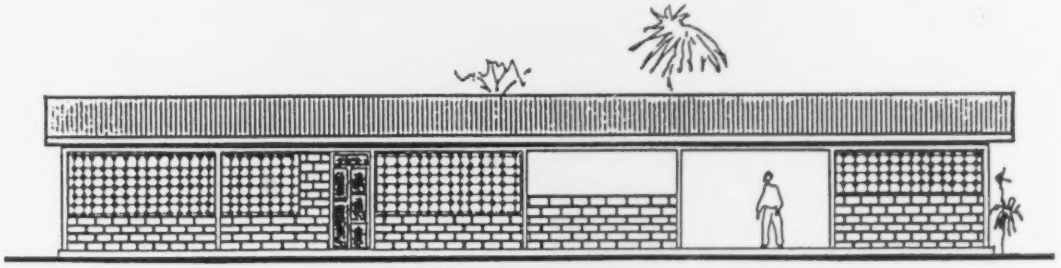
échelle 1 2 3



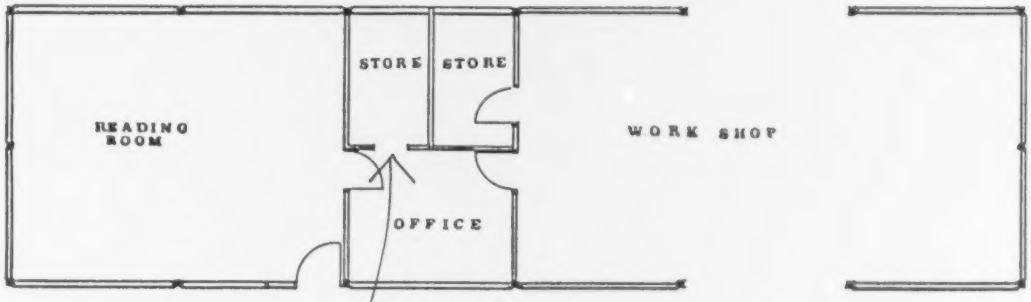
TYPICAL SECTION

échelle 1 2 3

PAYS	ETHIOPIA
PROJET	SCHOOL - BLOCK I - OPEC 706 ETH 10



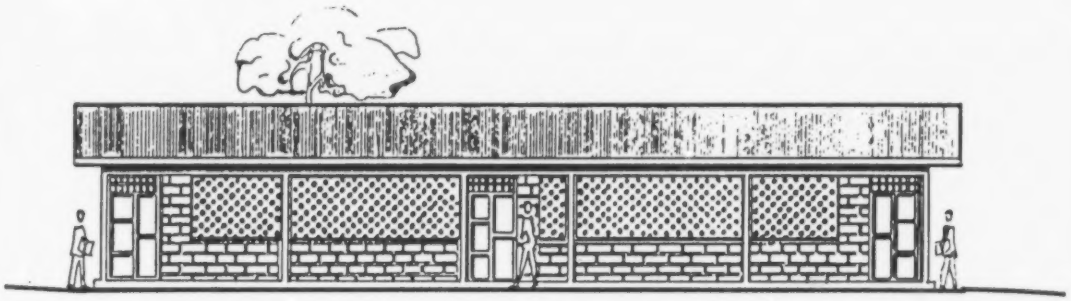
Front Elevation



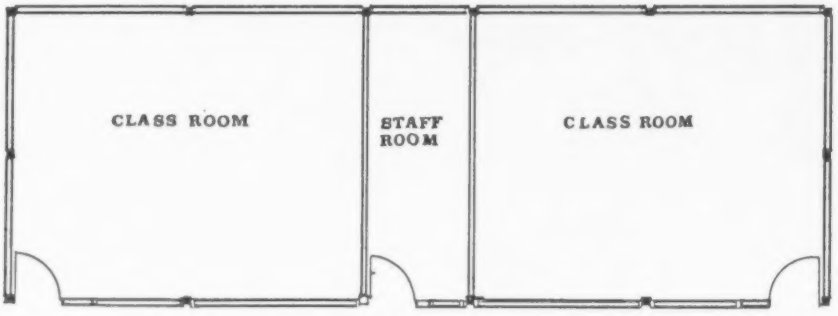
FLOOR PLAN

too narrow door (~.65m) Minimum width .76m

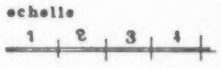
PAYS	ETHIOPIA
PROJET	SCHOOL - BLOCK I - OPEC 706 ETH 10



Front Elevation



Floor Plan



CONESCAL 1968	Rural Tipo	DATE JAN.75
TYPE OF SCHOOL Secondary General (rural)	LOCATION 80 GUYANA	COMPILED BY E. Almonte.
		LEGEND : SEE INSTRUCTIONS

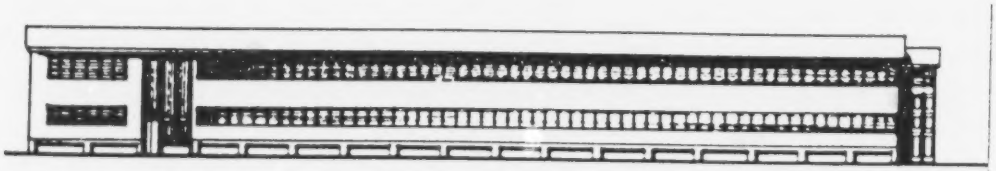
FINANCING	STUDENT AGES 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 +	DATE
GOVERNMENT [X]	LENGTH OF STUDIES 1 2 3 4 (5) 6 7 8 9	DESIGNED
BILATERAL* [ ]	YEARS REQUIRED FOR ENTRANCE I II III IV V VI VII VIII IX X XI XII	BUILT
INTERNATIONAL* [ ]		OPENED
SELF-FINANCED [ ]	N° OF SHIFTS / ENROLMENT PRINCIPAL SHIFT 1000 BOYS GIRLS / NUMBER OF BOARDERS BOYS GIRLS	DESIGN. CAPACITY

* EXPLAIN :

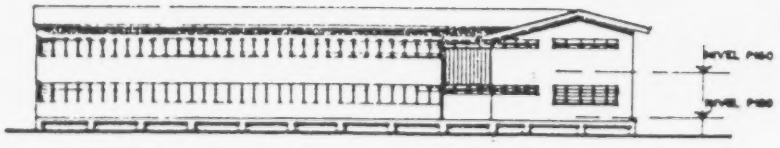
ARCHITECTURAL DRAWINGS

ORIENTATION : SHOW NORTH
Show N° of levels : G + X
G = ground floor. X = N° of levels above

Sketch plan and section : show allocation of spaces and date of construction for each building , marking it A , B , C ,------etc.



FACHADA SUR



FACHADA OESTE

PTO

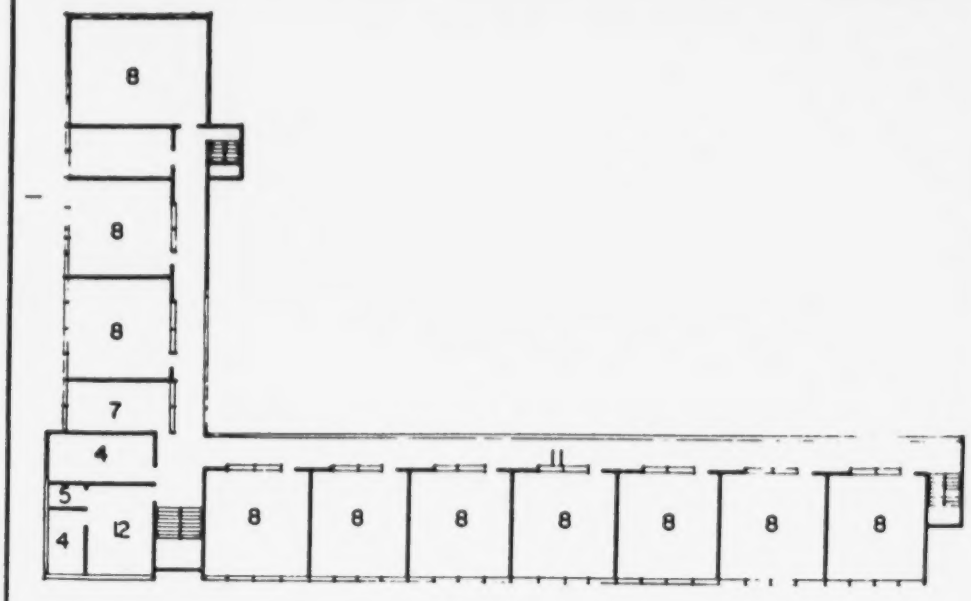
GRAPHIC SCALE 0 5m.
PLACE THE O WHERE CONVENIENT : BASIC INCREMENT : 5 mm

GRAPHIC CODE — TEACHING SPACES — ADMIN. — SERVICES — CIRCULATION — LODGING & BOARDING

DETECTRI . 62 rue de Bellechasse . 75007-PARIS . 70550-24 . n°13048 D

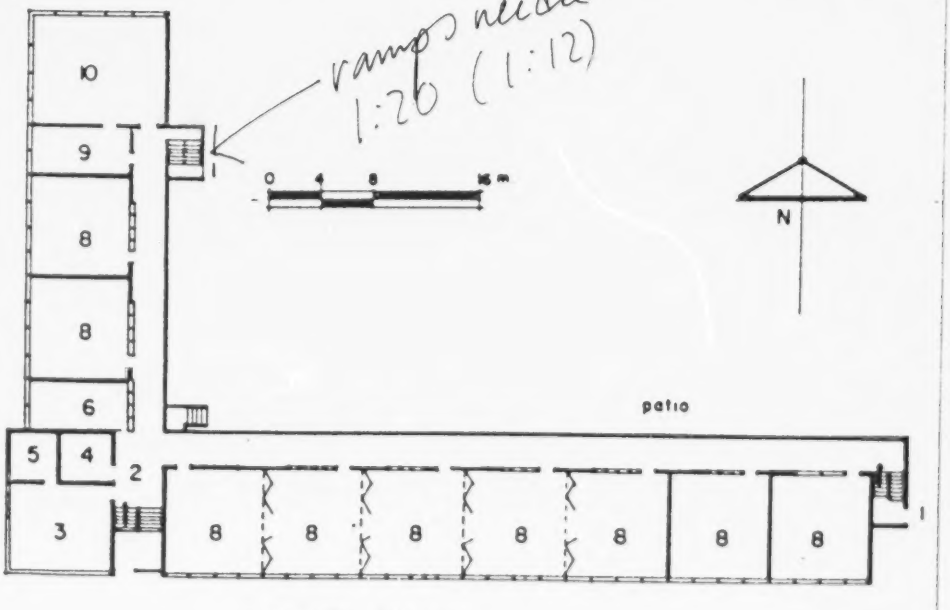
55 81

CLIMATIC REGIONS — UNITS — TENS — HUNDREDS — ROOM TYPE — WING — CARD TYPE — COUNTRY CODE — PROJECT IDENTITY — NATURE



PLANTA ALTA

ramps needed
1:20 (1:12)



PLANTA BAJA

OUTLINE OF BUILDING MATERIALS

STRUCTURE: R.C. Foundations / Timber superstructure.

ROOF: Double-pitched timber roof. / Timber floors. (decks).

WALLS: Timber panels / fixed and movable.

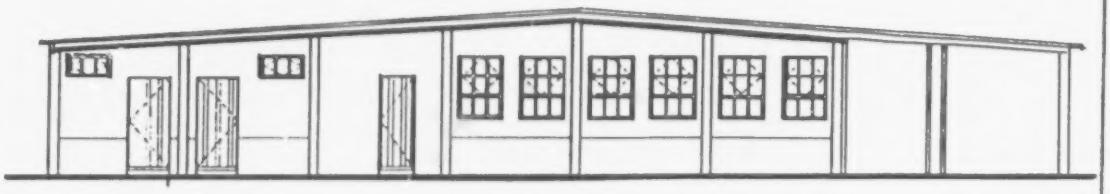
PARTITIONS: do.

ROOF COVERING:

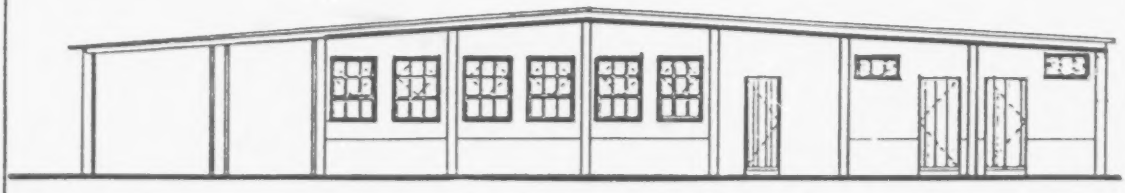
DOORS: Metal [illegible] / Timber doors / Laminated panels

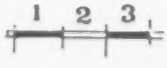
BEST COPY AVAILABLE

PAYS	Swaziland [82]
PROJET	Prototype Primary School

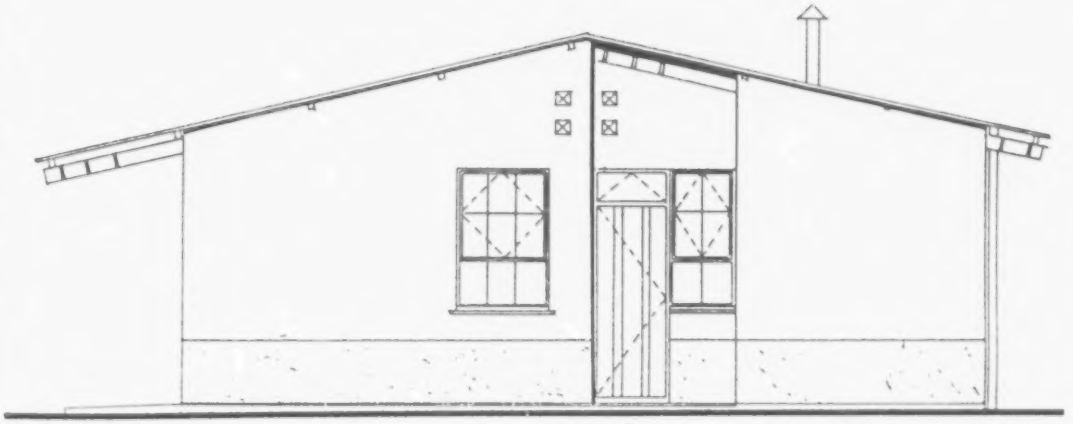


FRONT ELEVATION





PAYS	Swaziland
PROJET	Prototype Primary School

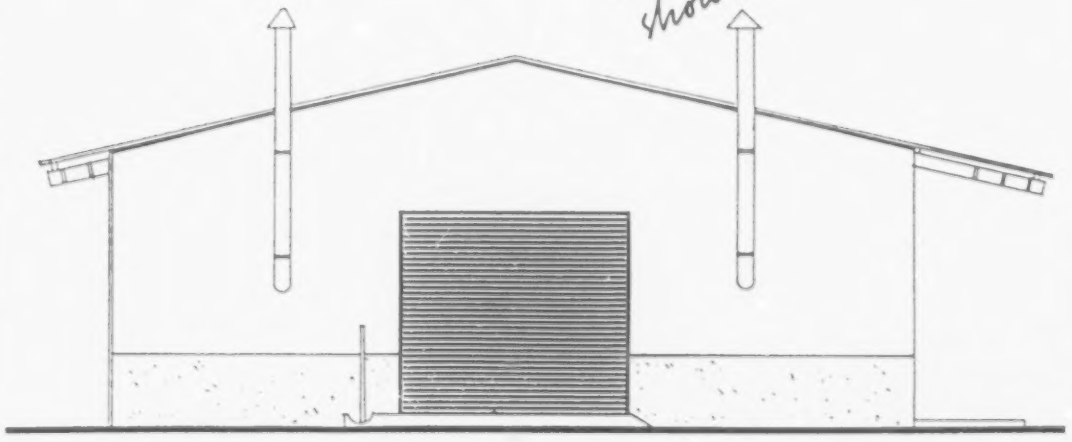


SIDE ELEVATION

ECHELLEE

1 2 3

door too narrow; outside measure ~ .75m, should be 7.9m



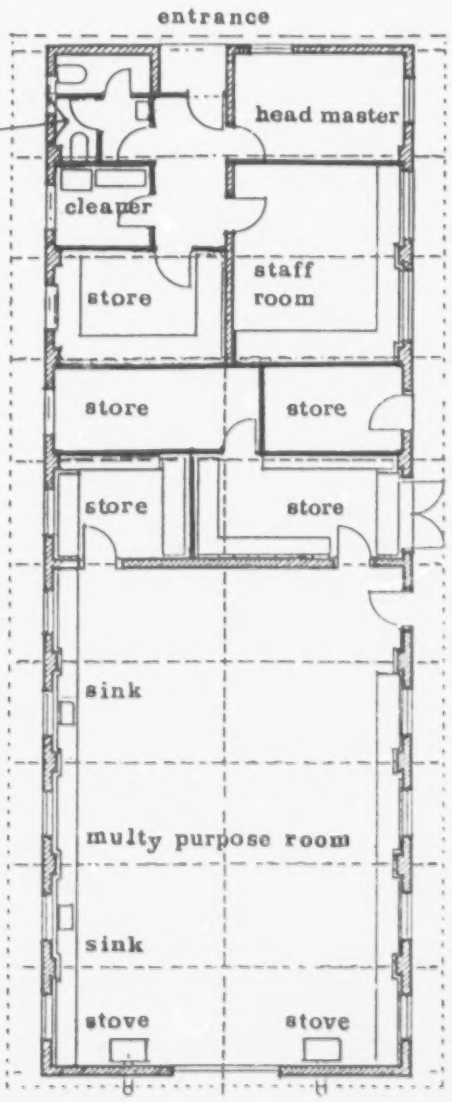
SIDE ELEVATION

ECHELLEE

1 2 3

PAYS	Swaziland 84
PROJET	Prototype Primary School

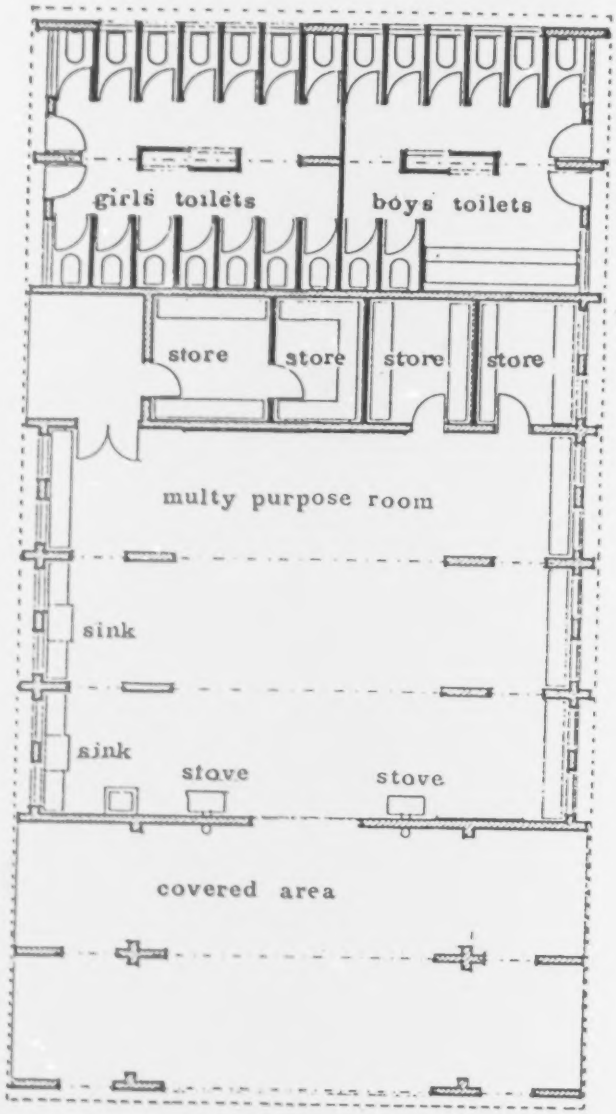
toilets and doors seem too narrow



Type design of administration and multy purpose room

PAYS	Swaziland '85
PROJET	Prototype Primary School

toilets are too narrow; at least one in each section should be larger; 1.5 x 1.6 m



Short - span - system
multy purpose room ablution

PUBLIC | PRIVATE | URBAN | RURAL | PRE-PRIM | PRIMAR. | MIDDLE | S.G. | S.T. | S.T.A. | S.T.I. | S.T.C. | S.T.V. | S.T.D. | TT | 96

SCHOOL TYPE

≤ 120 | 121-360 | 361-600 | 601-1000 | ≥ 1001

ENROLMENT

A

CLIMATIC ZONE

ROOM TYPE

CARD TYPE

REGIONS: AFRICA | ASIA | N.AMER. | ARAB.ST. | L.AMER. | EUROPE | OTHER

COUNTRY CODE — HUNDREDS | TENS | UNITS

PROJECT IDENTITY — TENS | UNITS

NAT. NORM. DESIGN.

UNESCO: Education Facilities Project Library

PROJECT N°: 334.01

SOURCE OF INFORMATION: Planeamiento y Diseño de la Escuela Primaria Latinoamericana · CONESCAL 1964

NAME OF SCHOOL: Escuela Primaria Incompleta Tipo. N°5

CARD ORDINAL: 1 OF: 1

DATE: FEB.75

TYPE OF SCHOOL: PRIMARIA

LOCATION: HAITI

COMPILED BY: E. Almonte

LEGEND: SEE INSTRUCTIONS

FINANCING

- GOVERNMENT [X]
- BILATERAL * [ ]
- INTERNATIONAL * [ ]
- SELF-FINANCED [ ]

STUDENT AGES: 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 +

LENGTH OF STUDIES: 1 2 3 4 5 6 7 8 9

YEARS REQUIRED FOR ENTRANCE: I II III IV V VI VII VIII IX X XI XII

N° OF SHIFTS | ENROLMENT PRINCIPAL SHIFT: BOYS / GIRLS | NUMBER OF BOARDERS: BOYS / GIRLS

DATE: DESIGNED 1963 | BUILT | OPENED

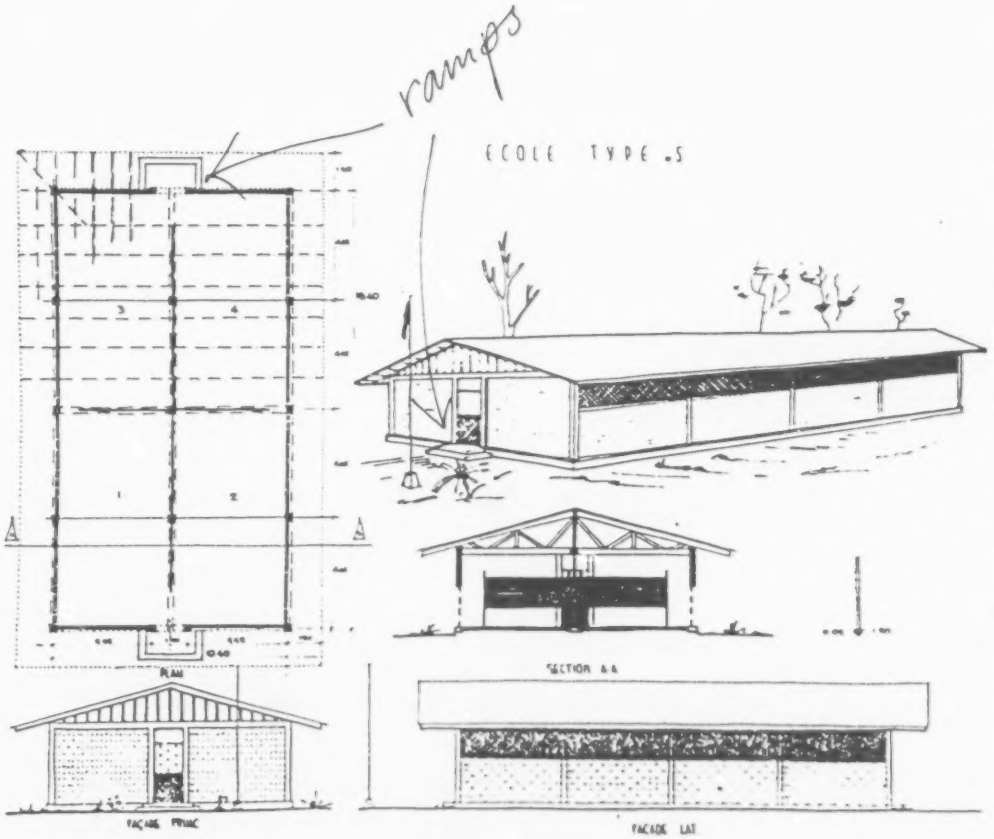
DESIGN. CAPACITY

* EXPLAIN:

ARCHITECTURAL DRAWINGS

ORIENTATION: SHOW NORTH
Show N° of levels: G + X
G = ground floor. X = N° of levels above

Sketch plan and section: show allocation of spaces and date of construction for each building, marking it A, B, C, ...etc.



87

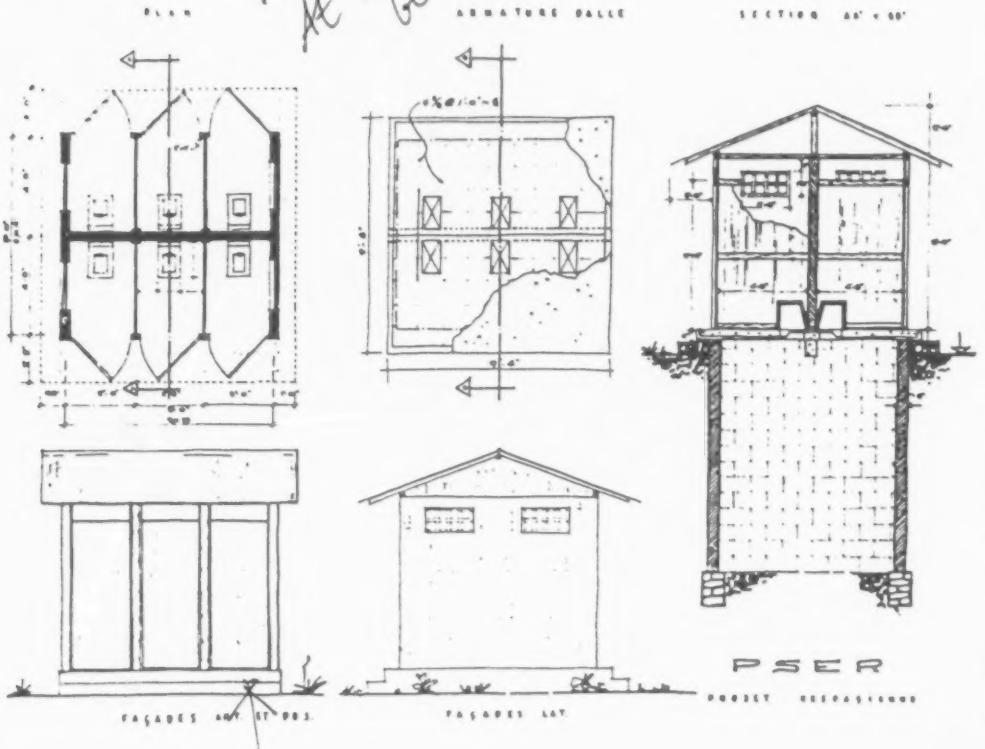
GRAPHIC SCALE 0 3m.

PLACE THE O WHERE CONVENIENT: BASIC INCREMENT: 5 mm

PTO

ARCHITECTURAL DRAWINGS (continued)

toilet size
.9 x 1.2 m.
At least one should
be 1.5 x 1.6 m



steps to be avoided

OUTLINE OF BUILDING MATERIALS

STRUCTURE :

ROOF :

WALLS :

PARTITIONS :

ROOF COVERING :

DOORS :

WINDOWS :

SCHOOL TYPE: PUBLIC | PRIVATE | URBAN | RURAL | PRE-PRIM. | PRIMAR. | MIDDLE | S.G. | S.T. | S.T.A. | S.T.I. | S.T.C. | S.T.V. | S.T.D. | T.T. | BB | ENROLMENT: ≤ 120 | 121-360 | 361-800 | 901-1000 | ≥ 1001 — A

UNESCO : Education Facilities Project Library

PROJECT N°: 219.01

SOURCE OF INFORMATION: Planeamiento y Diseño de la Escuela Primaria Latinoamericana CONESCAL 1964

NAME OF SCHOOL: Escuela Unitaria Completa Tipo A

CARD ORDINAL: 1 OF: 2

DATE: FEB. 75

TYPE OF SCHOOL: PRIMARY

LOCATION: ECUADOR

COMPILED BY: E. Almonte

LEGEND: SEE INSTRUCTIONS

FINANCING
- GOVERNMENT [X]
- BILATERAL * [ ]
- INTERNATIONAL * [ ]
- SELF-FINANCED [ ]

STUDENT AGES: 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 +

LENGTH OF STUDIES: 1 2 (3) 4 5 6 7 8 9

YEARS REQUIRED FOR ENTRANCE: I II III IV V VI VII VIII IX X XI XII

N° OF SHIFTS: 1

ENROLMENT PRINCIPAL SHIFT: 48 (BOYS / GIRLS)

NUMBER OF BOARDERS: (BOYS / GIRLS)

DATE DESIGNED: 1962 — BUILT — OPENED

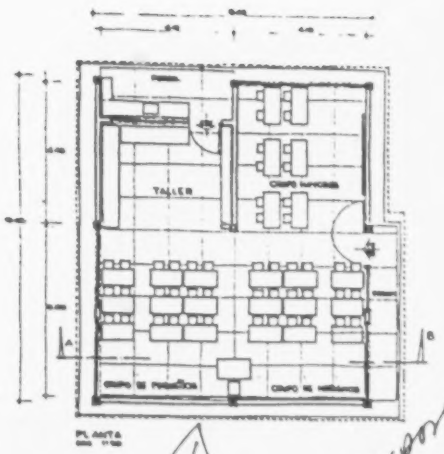
DESIGN. CAPACITY: 48

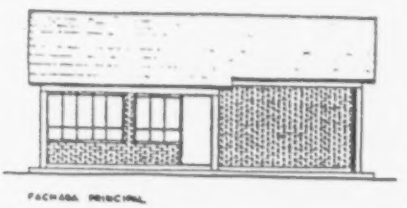
* EXPLAIN:

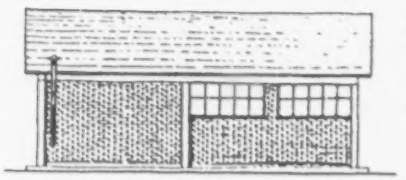
ARCHITECTURAL DRAWINGS

ORIENTATION : SHOW NORTH
Show N° of levels : G + X
G = ground floor. X = N° of levels above

Sketch plan and section : show allocation of spaces and date of construction for each building , marking it A , B , C ,------etc.




FACHADA PRINCIPAL


FACHADA POSTERIOR

larger, multi-purpose classroom convenient for persons with hearing difficulties

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GRAPHIC SCALE 0 1m.
PLACE THE 0 WHERE CONVENIENT : BASIC INCREMENT : 5 mm

GRAPHIC CODE: TEACHING | ADMIN. | SERVICES | CIRCULATION | LODGING &

PTO

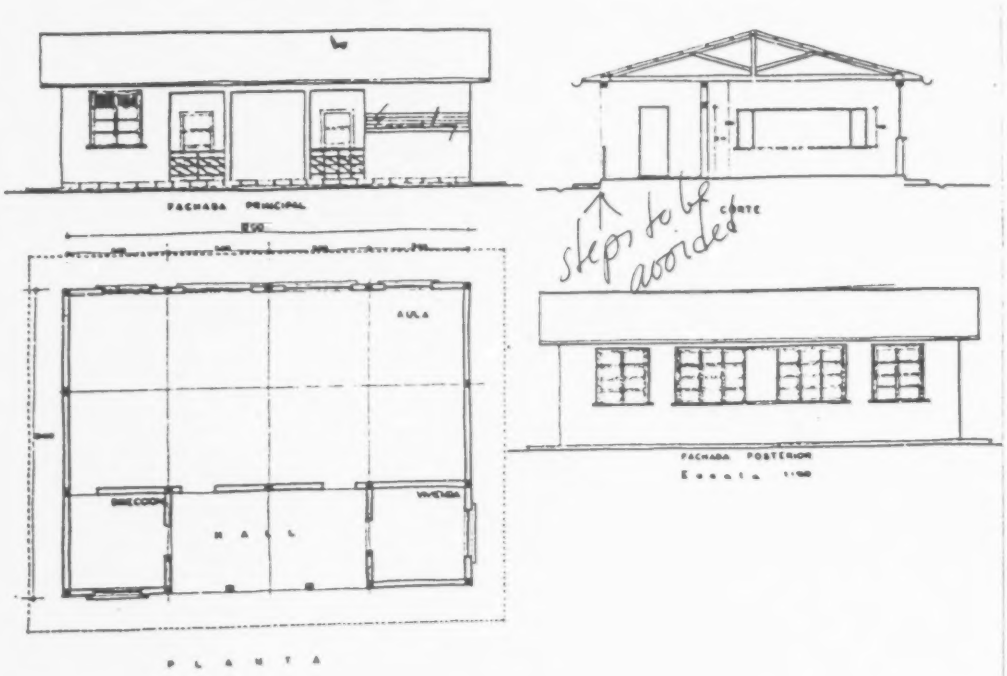
REGIONS: AFRICA | ASIA | N.AMER. | ARAB.ST. | L.AMER. | EUROPE | OTHER

COUNTRY CODE: HUNDREDS | TENS | UNITS

PROJECT IDENTITY

NATUR: NORM. | DESIGN. | EXIST.B

ARCHITECTURAL DRAWINGS (continued)



OUTLINE OF BUILDING MATERIALS

STRUCTURE:

ROOF:

WALLS:

PARTITIONS:

ROOF COVERING:

DOORS:

WINDOWS:

CONCLUSIONS

This Handbook is not the end product of extensive research. It is merely the outcome of a somewhat superficial review of a number of documents and designs. This is not because the issue, 'design guidelines for easy access to educational buildings', does not merit a comprehensive study, but rather because a Handbook by definition is eclectic, summing up the implications of more basic studies with the common sense gained from practice. There is a need for further research on the subject, and Unesco is well advised to seek further funding for this.

A number of conclusions or pertinent issues have however emerged while working on this Handbook. They are introduced in this section and could be used as "food for thought" with respect to future undertakings within this area:

Many documents, but...

* There is a wealth of documents on educational buildings, and on design for the handicapped. These two issues do not seem to have been integrated earlier to any large extent. This means that the design implications of general documents have to be assessed by the designer, or the client, on an ad hoc basis for each and every school project anew.

access difficult, and...

* Access to relevant information on design for the handicapped is not easy, since many documents are developed within the context of building in industrialized countries, and might therefore be considered to be of limited relevance for simple school-buildings in developing countries.

little information, due ...

* The other side of the coin is that out of the wealth of documents on educational buildings, only a very limited number include the implications of physical handicap. In search of these documents, one finds that some thesauri, catalogues and directories do not list many key-words on the issue, and in particular, that there are few documents related to these key-words.

CONCLUSIONS

weak awareness, and...

* There does thus seem to be a need to raise the awareness of those commissioning and producing documents on educational buildings, on the needs of the handicapped user. Further, those selecting key-words and writing abstracts for documents should be asked to look for and include this aspect.

* It could be argued, that schools in any particular country should not be designed according to some set of "global" codes and regulations, but according to those of that particular country.

no codes...

However justified this argument might be, it is a fact that building codes in a number of developing countries do not include the aspect of design for the handicapped to any comprehensive extent. Further, these codes are frequently not applicable to school buildings, since too low cost and simple design is required for e g rural primary schools.

Unchs conducted a "SEMINAR OF EXPERTS ON BUILDING CODES AND REGULATIONS IN DEVELOPING COUNTRIES"[9] in 1980. In the second recommendation of this seminar, the word handicapped appears for the first and only time. The recommendation states that:

> "building codes and regulations should place emphasis on meeting the basic needs of the poor in respect of human settlements.
> This implies (i a) that:
> Building codes and regulations reflect the needs of specific population groups such as new rural-urban migrants, children and the **handicapped**" (my parentesis and emphasis).

yet, because...

It will however take some time yet until building codes and regulations in most developing countries are in line with this recommendation. In the meantime, documents such as this Handbook might be justified and prove to be of use.

CONCLUSIONS

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no R&D!

* It is surprising, that there is so little R&D on the issue of (school) building design in developing countries with respect to the handicapped.

One reason might be, that this is not a subject which lends itself to basic research. There is nevertheless a scope for increasing the amount of applied R&D on the subject, considering the magnitude of the problem, and the fact that building codes and regulations are conventionally based on research findings.

Evaluate...

* One way to go about it would be to do studies aimed at evaluating a number of existing schools ("good" and "bad") with respect to their adaption to the needs of handicapped persons. Key aspects to be evaluated would typically be:

site and rooms, on...
-access to site including orientation
-access to class-room and other rooms

moving...
-limits in usefulness of class-rooms for those with moving difficulties

hearing...
-limits to learning for those with hearing difficulties

seeing aspects, and...
-limits to learning for those with seeing difficulties

cost...

An evaluation would also assess the cost implications a/ of modifying the existing building and b/ if a barrier-free design had been used from the beginning. The outcome of a number of such evaluations would be that the relative importance of different design elements could be established.

benefit, to set...

* A priority list could then be made on the relative importance of design elements, linked to their respective cost implications. Thus a tentative cost-benefit ratio would be established, so that the client and designer could opt for a degree of adaption to the needs of the handicapped, feasible within budget limits. Easy access to educational buildings by the physically handicapped is basically an issue of priorities.

your priorities!

READING LIST

1/
United Nations
DESIGNING WITH CARE - a guide to
ADAPTION OF THE BUILT ENVIRONMENT FOR DISABLED PERSONS

1983, 103 p

Abstarct:
Guide prepared in connection with the International Year of Disabled Persons 1981, on behalf of UNCHS and SIDA, and of particular relevance for developing countries.

2/
Unchs
TRILINGUAL THESAURUS in the field of human settlements

1986, 126 p

Abstarct:
Thesaurus

3/
Unchs
HABI RES - on-going research data base in the field of human settlements

1986, 123 p

Abstract:
Catalogue of current research, based on world-wide enquiry, and in accordance with the UNCHS Thesaurus.

READING LIST

4/
Unchs
HABITAT DIRECTORY

1986, 377 p

Abstact:
Directory, listing 1784 organizations dealing with the issue of human settlements in developing countries

5/
Unesco/EFS
EDUCATIONAL FACILITIES THESAURUS - PERMUTED DESCRIPTOR LIST

1981, 76 p

Abstract:
Thesaurus

6/
Unesco/DIC
CATALOGUE OF DOCUMENTS AND PUBLICATIONS

1987, 162 P

Abstract:
Catalogue

7/
Unesco Regional Office for Education in Asia, Bangkok
IMPROVING THE ACOUSTIC ENVIRONMENT IN OPEN HALL SCHOOLS

1973, 4 p

Educational building Digest 1

Abstract:
Summary of findings from study by Chaudhury, N.K.D., on noise control in open hall schools

---

8/
Chaudhury, N.K.D.
SOUND DIFFRACTION AROUND MOVABLE PARTITIONS IN TEACHING SPACES

1973

Unesco Regional Office for Education in Asia, Bangkok

Abstact:

9/
Unchs and the Swedish Council for Building Research (BFR)
UN SEMINAR OF EXPERTS ON BUILDING CODES AND REGULATIONS IN DEVELOPING COUNTRIES

1980, 85 p

D18:1980
Abstract:
Report from seminar with participants from twenty nations, mainly d c's and int'l organisations. Includes ten recommendations, seminar proceedings, overview on building codes and regulations in d c's and abstracts of theme papers.

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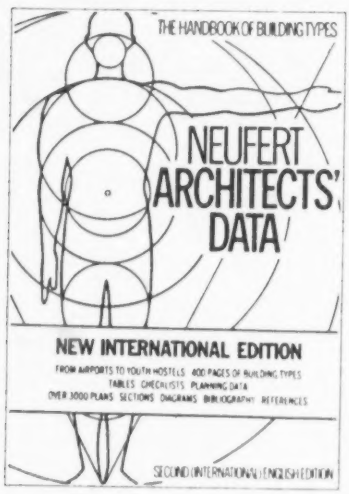
2 Annotated bibliography

Goldsmith, Selwyn
DESIGNING FOR THE DISABLED

1976, 525 p Third edition
London, RIBA Publication Limited

Abstract:
A catalogue of design recommendations for architects and concerned with the planning and management of buildings used by handicapped people. Accepted internationally as the definitive work on the subject.

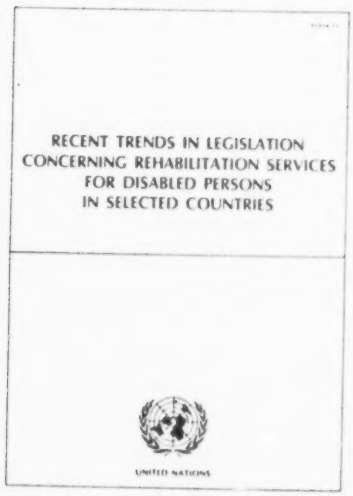


Neufert, Ernst
ARCHITECT'S DATA. THE HANDBOOK OF BUILDING TYPES

Second (international) English edition
1980, 400 p

Published by Granada, P O Box 9, St Albans, Herts AL2 2NF, England

Abstract:
From airports to youth hostels, 400 pages of different building type studies. Tables, checklists, planning data. Over 300 plans, sections, diagrams, bibliography references
Sections re disabled
- doors and windows
- corridors, stairs, elevators.



Department of Economic and Social Affairs, United Nations
RECENT TRENDS IN LEGISLATION CONCERNING REHABILITATION SERVICE FOR DISABLED PERSONS IN SELECTED COUNTRIES

1977, 31 p
New York

Abstract:
Various rehabilitation programs which provide for those disabled persons who are excluded from the ordinary social services. Examples are given from countries in both the developing world as well as industrialized countries.

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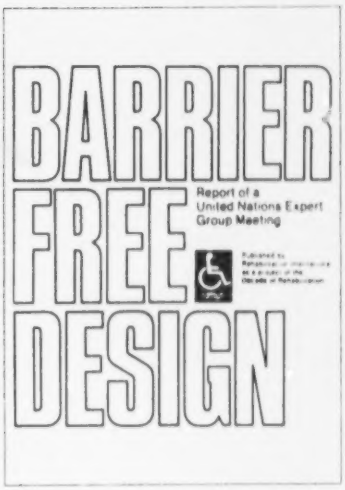
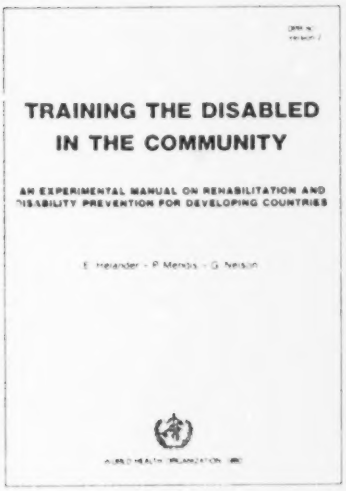
Appendix 2



United Nations expert group meeting
BARRIER FREE DESIGN

1975, 35 p
Published by Rehabilitation International

Abstract:
The designing of areas suitable for disabled persons. Layouts and removal of obstacles in and around buildings. Examples of co-ordinated activities undertaken in a few countries.
With illustrations.


TRAINING THE DISABLED
IN THE COMMUNITY
AN EXPERIMENTAL MANUAL ON REHABILITATION AND
DISABILITY PREVENTION FOR DEVELOPING COUNTRIES

Helander E, Mendis P, Nelson G
TRAINING THE DISABLED IN THE COMMUNITY
Subtitle: An experimental Manual on Rehabilitation and Disability Prevention for Developing Countries.

WHO 1980, 1078 p
(DPR/80.1 Version 2)
Published by WHO, Geneva, Switzerland

Abstract:
The manual contains:
1. Training packages
2. Six booklets, one each for training of the six categories of disabled persons
3. Four Guides: for policymakers and planners; for local supervisors; for community leaders; for teachers.

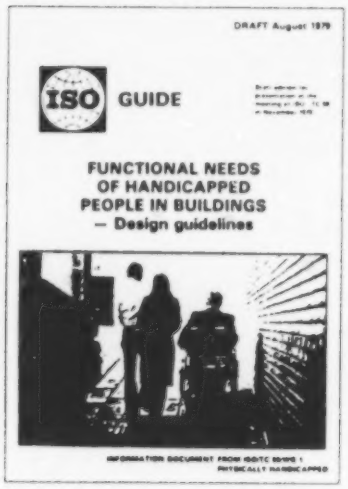
With illustrations.

International Organization for Standardization, ISO
NEEDS OF THE HANDICAPPED IN BUILDINGS

1981, 15 p
A declaration of ISO/TC 59/WG1
(ISO's Technical Committee 59, Working Group 1)

Abstract:
Brief design recommendations with illustrations.

Appendix 2



ISO Guide
FUNCTIONAL NEEDS OF HANDICAPPED PEOPLE IN BUILDINGS, DESIGN GUIDELINES

1979, 15 p

Information document from ISO/TC 59/WG1 published by Byggstandardiseringen, Drottning Kristinas Väg 73, S-114 28 STOCKHOLM

Abstract:
Basic advice to designers fo internal and external environments for the handicapped including the needs of handicapped persons in buildings.
With illustrations.

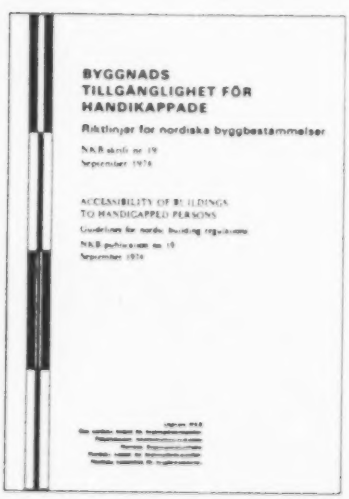
Council of Europe
ADAPTATION OF HOUSING AND SURROUNDING AREAS TO THE NEEDS OF DISABLED PERSONS

1979, 45 p
Strasbourg (P-SG (79)4)

The resolution was adopted by the Committee of Ministers in November 1977.

The report was prepared in 1977, revised 1978, by the Joint Committee on the Rehabilitation and Resettlement of the Disabled.

Abstract:
The functional basis for persons confined to wheel-chairs including the adoption of houses, cars, etc for their need. Planning criteria and their usefulness.



The Nordic Committee on Building Regulations, NKB
ACCESSIBILITY OF BUILDINGS TO HANDICAPPED PERSONS
Subtitle: Guidelines for Nordic Building Regulations

1974, 30 p

(NKB publication no 19) UDK:721.011:362.4

Abstract:
Guidelines for Nordic building regulations concerning the handicapped people. Co-ordinated rules pertaining in the Nordic countries.

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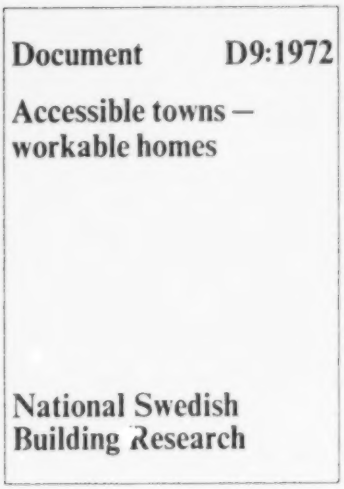
Appendix 2



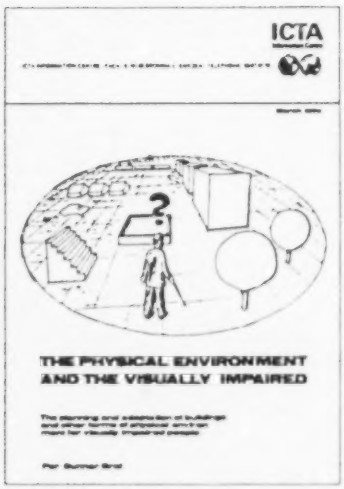
National Swedish Building Research
ACCESSIBLE TOWNS – WORKABLE HOMES

Document D9:1972

(Distribution: Svensk Byggtjänst, Box 1403, S-111 84 STOCKHOLM)

UDK 711.4:362.4
728.1:362.4
SfB A
ISBN 91-540-2044-1

Abstract:
Swedish planning criteria for housing adapted to disabled persons. Use of standard dwellings and adaptation to the urban environment.



Braf, P-G
THE PHYSICAL ENVIRONMENT AND THE VISUALLY IMPAIRED
(The Planning and adaptation of buildings and other forms of physical environment for visually impaired people)

1974, 34 p
ICTA Information Centre

Abstract:
A handbook for planning and forming the physical environment in such a way that it is suitable for persons with impaired vision but also makes daily life easier for everybody.
With illustrations.

Housing & Transportation: Guidelines for impoving access for disabled people
INTERNATIONAL COMMISSION ON TECHNICAL AIDS

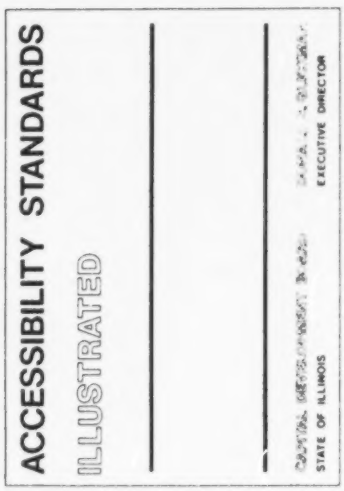
Noble, C Wycliffe
GUIDELINES FOR IMPROVING ACCESS FOR DISABLED PEOPLE

Publication by:
The Royal Association for Disability and Rehabilitation (RADAR). Not yet published.

On behalf of:
International Commission on Technical Aids (ICTA): Housing and Transportation of Rehabilitation International (RI).

Abstract:
The publication will alert those who are responsible for setting up strategic plans for the erection of buildings open to the public in urban and city developments in developing countries. In many situations, consortia from industrialised countries is used and often the needs of disabled people are not provided in the solutions that are being offered.

Appendix 2

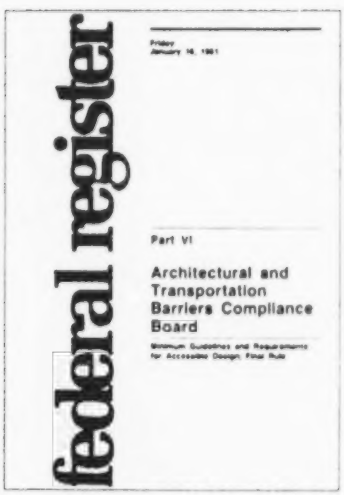


Jones, Michael A
ACCESSIBILITY STANDARDS ILLUSTRATED

Editor:
Donald S Glickman, Capital Development Board, State of Illinois, USA

1978, 217 p

Abstract:
A comprehensive handbook. Illustrated with photographs and sketches. US examples of the adaptation of the interior of buildings and the outdoor environment to various types of handicapped persons. Hazards are pointed out.



Federal Register, USA
Architectural and Transportation Barriers Compliance Board, Part VI
MINIMUM GUIDELINES AND REQUIREMENTS FOR ACCESSIBLE DESIGN; FINAL RULE

1981, 34 p

(36 CFR Part 1190: Federal Register, Vol 46 no 11)

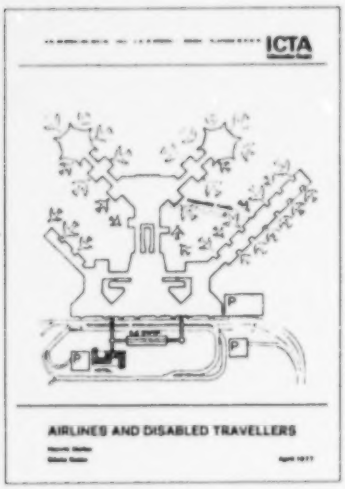
Abstract:
US rules for the removal of obstacles to disabled persons using the physical environment. Planning criteria.

Association Suisse des Invalides
GUIDE POUR ELIMINER LES BARRIERES ET LES OBSTACLES ARCHITECTURAUX

1976, 63 p

Abstract:
Guidelines for architects with illustrations. Planning criteria for disabled persons' accessibility in outdoor environments and buildings. Issued in Switzerland.

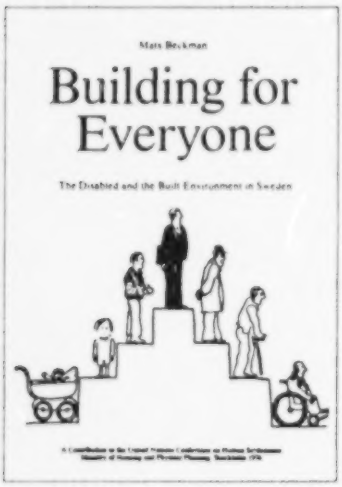
Appendix 2



Müller, Henrik and Rolén, Gösta
AIRLINES AND DISABLED TRAVELLERS

1977, 54 p
ICTA Information Centre, Stockholm, Sweden

Abstract:
An analysis of the situation for disabled persons using airtravel facilities including various obstacles of a physical and organizational nature. Proposals are included of suitable measures to be taken.
With illustrations.



Beckman, Mats
BUILDING FOR EVERYONE

1976, 108 p

Ministry of Housing and Physical Planning, Stockholm, Sweden.

Abstract:
Building for Everyone, a Review.
The Disabled and the Built Environment in Sweden. Contribution to the United Nation's Conference on Human Settlements. A description of the conditions in Sweden, problems, measures for security, regulations and examples of physical environments adapted to the disabled.
With illustrations.

Rehabilitation International in cooperation with the United Nations
THE ECONOMICS OF DISABILITY: INTERNATIONAL PRESPECTIVES

1981, 237 p
Rehabilitation International, 432 Park Avenue, South, New York, New York 10016, USA.

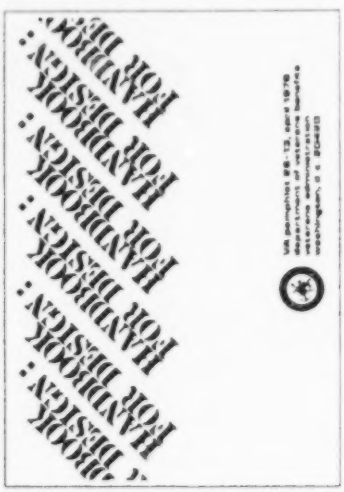
Abstract:
The financial situation for both the disabled and the agencies helping them.
With illustrations.

Appendix 2

Belgium Association National pour le Logements des Handicapés
ARCHITECTURE ET ACCESSIBILITE, documents téchniques 1

12 p

Abstract:
Belgian rulès for adoption of the wheel-chairs confined to indoor and outdoor environment. Special attention is paid to the dimensions wheel-chair movements require.
With illustrations.

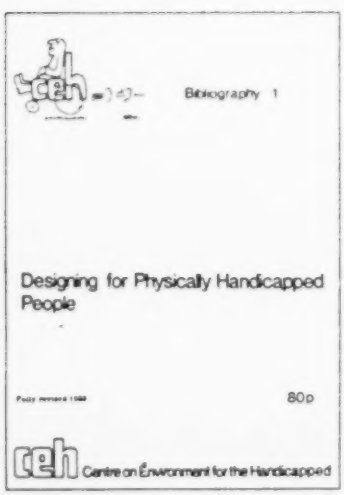


Department of Veterans Benefits, Veterans Administration, Washington, USA
HANDBOOK FOR DESIGN: SPECIALLY ADAPTED HOUSING

1978, 79 p (VA pamphlet 26–73)

Department of Veterans Benefits, Veterans Administration, Washington DC 20420, USA

Abstract:
A design manual for adaptation of housing in USA to the requirements of physically disabled persons.



ceh, Centre on Environment for the Handicapped
BIBLIOGRAPHY 1: DESIGN FOR PHYSICALLY HANDICAPPED PEOPLE

1980, 44 p
London, ceh, 126 Albert Street, London NW1 7NF, England

Abstract:
A comprehensive annotated bibliography. The bibliography directs readers to the relevant design guidance, legislation and government circulars and to books, reports, and periodical articles to increase understanding of the needs of handicapped people. The bibliography mainly concerns the conditions in Great Britain.

Appendix 2

ACROD/ICTA, sub-commission Asia-Pacific Region

ASIA PACIFIC DISABILITY AIDS HANDBOOK 1982

Australian Council for Rehabilitation of Disabled International Commission on Technical Aids, Buildings and Transportation
18 Argyle Street, Sydney, NSW, 2000, Australia

Abstract:
The handbook is a compilation of information regarding appropriate indigenous technical aids and appliances for people with disabilities collected from within the Asia Pacific region. The information is presented in the form of individual data sheets for each aid or appliance with a diagram and details of designer and/or manufacturer.

Rehabilitation International
INTERNATIONAL STATEMENTS ON DISABILITY POLICY

1981

Published by Rehabilitation International

Abstract:
A selection of key policy statements. The major policy documents of the United Nations' system and several from the most representative of the non-governmental organisations.

NVR, Nederlandse Vereniging voor Revalidatie
ARCHITECTURAL FACILITIES FOR THE DISABLED

1973

Published by ICTA, Bromma, Sweden

Abstract:
A compilation of information from various countries has formed a basis for assessing some directions for requirements enabling handicapped persons to function in society. The publication concentrates on the requirements of physically handicapped persons and the basic data for freedom of movement can be obtained from the sketches containing information on dimensions of wheel-chair and reaching zones of handicapped persons.

3 Standards, bibliography

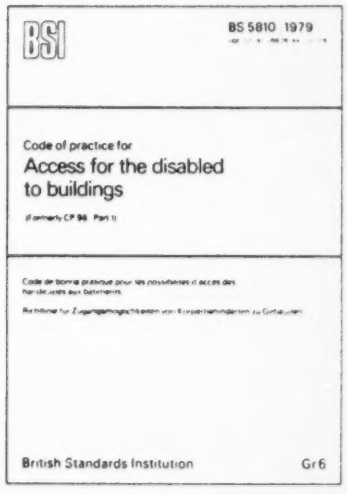
Standards Association of Australia
DESIGN RULES FOR ACCESS BY THE DISABLED
(Australian Standard 1428–1977)

1979. 36 p

UDC 721.052.362.4
SfB Ba4
ISBN 07262 1283.0

Abstract:
Australian Standard. Code of Practice concerning design rules for access by the disabled.

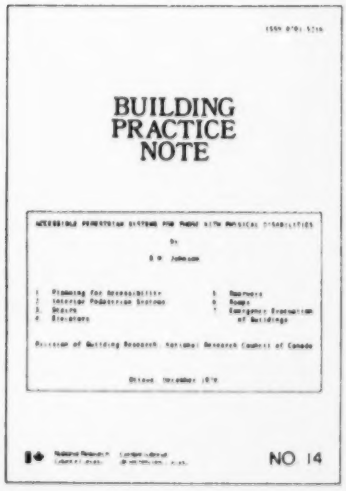
AS 1428-1977 including an annotated bibliography.



British Standards Institution
BS 5619
CODE OF PRACTICE FOR DESIGN OF HOUSING FOR THE CONVENIENCE OF DISABLED PEOPLE

1978

Abstract:
Recommendations are given for ramps, lifts, car parking, paths, doors, circulation spaces, floors, windows, kitchens, bedrooms, WCs, bathrooms, stairs, and services.



Canada, Building Practice Note No 14, Johnson, B M
ACCESSIBLE PEDESTRIAN SYSTEMS FOR THOSE WITH PHYSICAL DISABILITIES

1979, 47 p
(National Research Council, Canada)

ISSN 0701-5216.

Abstract:
The note describes the general planning of pedestrian circulation systems and the design requirements for internal pedestrian facilities with emphasis on the needs of the elderly or persons with physical disabilities.
1. Planning for Accessibility; 2. Interior Pedestrian Systems; 3. Stairs; 4. Elevators; 5. Doorways; 6. Ramps; 7. Emergency Evacuation of Building
With illustrations and including an annotated bibliography

Appendix 3

National Research Council of Canada, Ottawa
BUILDING STANDARDS FOR THE HANDICAPPED

(National Building Code of Canada, Supplement no 5, NRC No 11430)

1970, revised in 1980, 24 p

Abstract:
Canadian Building Standards for the Handicapped including an annotated bibliography.

Denmark, Ministry of Housing
BUILDING REGULATIONS

1977

Abstract:
The publication presents Danish Norms. Chapters 4 and 5, pp 48, 49, 50, concern moving and orientation difficulties for disabled persons.

MINISTERIET FOR INRIKESARENDENA
Finlands byggbestammelsesamling
F 1
PLANERING AV UTRYMMEN AVSEDDA FOR ALLMANHETEN MED BEAKTANDE AV UTRYMMENAS LAMPLIGHET FOR RORELSEHINDRADE
Foreskrifter och anvisningar
1978

Finland, Ministry of Home Affairs
THE PLANNING OF FLOOR SPACE FOR USE BY THE GENERAL PUBLIC WITH SPECIAL CONSIDERATION TO THEIR SUITABILITY FOR PERSONS WITH IMPAIRED MOBILITY

(Finland's Building Regulations)

1978, 7 p.

Abstract:
1. Presents the regulations concerning the dimensions of doorways and entrances with principal regard to general aspects fo safety.
2. Regulations issued during the autumn of 1973, with explanations in an official letter. § 85a proposal for a regulation,: Buildings and facilities used by the public should be accessible to persons whose mobility or orientational capacity is handicapped by age, invalidity or sickness.

Appendix 3

The French Association for Normalisation, Paris, (AFNOR)
BUILDING FOR THE PHYSICALLY HANDICAPPED

1978. 26 p
(NF P 91-201) NOT

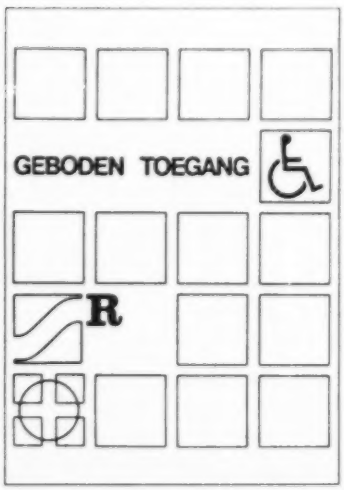
Abstract:
Building for the physically handicapped,

British Standards Institution (BSI)
Code of Practice for
ACCESS FOR THE DISABLED TO BUILDINGS

BS 5810:1979

UDC 721.051-056.26:69.026/028

Abstract:
The code concentrates on the essential provisions that need to be incorporated in buildings to ensure that they are conveniently usable by disabled people.
In the case of certain building types which are financed in the UK from public funds, for example health, welfare and educational buildings, the government departments concerned recommend standards of provision and design including those for disabled people.



Holland, Nederlandse Vereniging voor Revalidatie (NVR)
GEBODEN TOEGANG

1973, revised in 1979, 134 p

Abstract:
Recommendations. Including an annotated bibliography. The recommendations are systematically laid down in sketches.

Appendix 3

NZS 4121
Part 1 : 1971

NEW ZEALAND STANDARD

Code of Practice for
DESIGN FOR ACCESS
BY HANDICAPPED PERSONS
PART 1
PUBLIC BUILDINGS AND FACILITIES

SANZ STANDARDS ASSOCIATION OF NEW ZEALAND

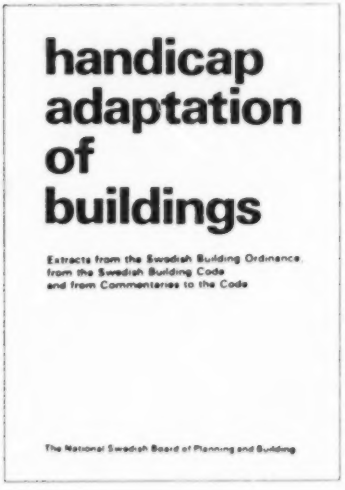
Standards Association of New Zealand, Wellington
CODE OF PRACTICE FOR DESIGN FOR ACCESS BY HANDICAPPED PERSONS, PART 1: PUBLIC BUILDINGS AND FACILITIES

1971, 28 p

(New Zealand Standard NZS 4121, part 1, 1971)

UDC 721.052:362.4

Abstract:
Code of Practice for Design for Access by Handicapped Persons. Part 1: Public Buildings and Facilities, August 1974. Including an annotated bibliography.
(Mandatory when adopted by a local authority.)


handicap adaptation of buildings

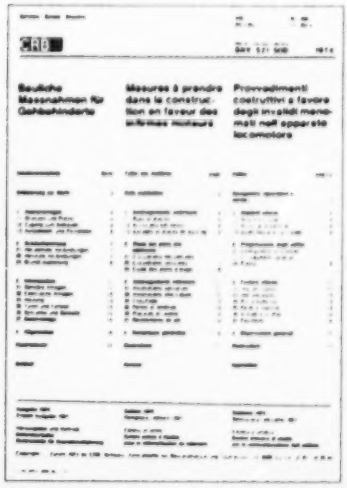
Extracts from the Swedish Building Ordinance, from the Swedish Building Code and from Commentaries to the Code

The National Swedish Board of Planning and Building

The National Swedish Board of Planning and Building
HANDICAP ADAPTATION OF BUILDINGS

1981
Liber Förlag, Stockholm, Sweden
ISBN 91-38-06626-2

Abstract:
Extracts from the Swedish Building Ordinance, from the Swedish Building Code and from Commentaries to the Code.


SNV

Bauliche Massnahmen für Gehbehinderte

Mesures à prendre dans la construction en faveur des infirmes moteurs

Provvedimenti costruttivi a favore degli invalidi motulesi apparato locomotore

MEASURES TO BE APPLIED IN BUILDINGS TO FACILITATE FOR DISABLED PERSONS

1974, 23 p

Norme SNV 521 500 1974
SfB (9) – (98)
DK/CDU 721:362.4

Abstract:
Norm.

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Appendix 3

American National Standard
specifications for making buildings and facilities accessible to and usable by physically handicapped people

American National Standards Institute Inc, New York, ANSI
SPECIFICATIONS FOR MAKING BUILDINGS AND FACILITIES ACCESSIBLE AND USABLE BY PHYSICALLY HANDICAPPED PEOPLE

1980. 67 p

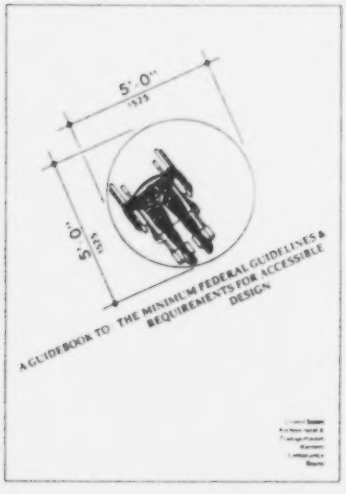
(ANSI A117-1 – 1980)

Abstract:
American National Standard, including an annotated bibliography. Specifications for making buildings and facilities accessible to and usable by the physically handicapped.

The Senate and the House of Representatives of the United States of America
PUBLIC LAW 90-480

August 12, 1968

Abstract:
An act to insure that certain buildings financed with federal funds are so designed and constructed as to be accessible to the physically handicapped.



United States Architectural and Transportation Barriers Compliance Board
A GUIDE BOOK TO: THE MINIMUM FEDERAL GUIDELINES AND REQUIREMENTS FOR ACCESSIBLE DESIGN

USA January 1981

Abstract:
The guidelines and requirements provide a basis for the issuance of consistent and improved accessibility and usability standards by some US authorities including the Federal Standard Setting Agencies. The booklet is printed in a format which should be readily usable by building officials and building managers. Illustrated.

/'SPECIAL SCHOOLS//

12/06/89

//N. AKIKI ED/SDI//

Abraham Moss Centre, Manchester. Progress report

London, 1978. 56 p. + publications list, illus. (A and B Paper; 1) (eng).
community facilities - school-community relationship; child care centres; out of school education; adult education; programmes; recreational facilities; fine arts; audiovisual aids; special schools; case studies; United Kingdom.
DOC. CODE: efs.

02449

The American Society of Landscape Architects Foundation

Barrier free site design. Washington, D.C., April 1975. 82 p. (eng). // U.S. Department of Housing and Urban Development and Research
barrier free design - design guidelines; site planning; building regulations; cost effectiveness; ergonomics; leisure; outdoor lighting; outdoor teaching spaces; handicapped; special schools; United States of America; norms and standards.
DOC. CODE: efs; lad.

01787

An Annotated bibliography of current sources and guidelines on architectural accessibility for the physically handicapped

Wild, Lynn Charles. Monticello, Illinois, Council of Planning Librarians, March 1978. 12 p. (CPL Exchange Bibliography; 1489) (eng).
bibliographies - barrier free design; handicapped; special schools; facilities planning and design; design guidelines; building improvement; norms and standards.
DOC. CODE: efs.

02377

L'Association nationale d'aide aux handicapes mentaux (Belgium)

L'Hebergement des arrieres mentaux. Bruxelles, 1974. pp. 4-9 (photostat). (Amentia; 34) (fre).
special schools - housing.
DOC. CODE: efs.

00350

Boarding schools for maladjusted children

London, Her Majesty's Stationery Office, 1965. pp. 1-16. (Building Bulletin; 27) (eng).
special schools - boarding schools; boarding accommodation; United Kingdom.
DOC. CODE: efs.

01297

BEST COPY AVAILABLE

Centro Brasileiro de Construcoes e Equipamentos Escolares

Sugestoes para projetos de escolas destinadas a deficientes fisicos. Rio de Janeiro, Ministerio da Educacao e Cultura, Secretaria-Geral, 1977. 35 p., illus., 28 cm. (CEBRACE Publ.; 14) (por). Translation of "Designing schools for the physically handicapped", Ontario, Ministry of Education.
special schools; Brazil; Canada.
DOC. CODE: ep.

01871

Centro de educacion especial para deficientes mentales, en Chile (Analisis de proyectos arquitectonicos y de edificios destinados a la educacion)

Saint-Jean, Gaston. Mexico, Centro Regional de Construcciones Escolares para America Latina, Abril 1967. pp. 535-538, illus. (CONESCAL 6) (spa).
Article deals with special schools for mentally retarded children in Chile - briefly discusses the pedagogical and technical aspects of the facility, finishes, building specifications, and gives cost per element, cost per student data and space requirements.
DOC. CODE: efs; cnscl.
MICROFICHE: 75xef0200. 00219

Centro de rehabilitacion para ninos lisiados en Santo Domingo, Rep. Dominicana

Cott, E.; Gautier, S. Mexico, Centro Regional de Construcciones Escolares para America Latina, Abril 1967. pp. 539-542. (CONESCAL 6) (spa).
Article deals with special schools in the Dominican Republic - briefly describes a rehabilitation centre for physically and mentally handicapped children; discusses architectural and pedagogical aspects and gives an area analysis, space requirements, a space types list and diagramatic plans of the facility.
DOC. CODE: efs; cnscl.
MICROFICHE: 75xef0200. 00220

Day centres for mentally retarded adults

Grunewald, Karl. Bruxelles, International League of Societies for Mentally Handicapped, 1975. 71 p. (eng).
special schools - barrier free design; handicapped; child care centres.
DOC. CODE: efs.

01701

De oppna skolorna ett ar senare: attitydutvecklingen bland larare pa lag- och mellanstadiet. En uppfoljning av 1972 ars rapport

Rohr, G.; Gran, Bertil. Malmo, School of Education, Dept. of Educational and Psychological Research, Oct. 1975. 69 p. + annexes, 30 cm. (Pedagogisk-psykologiska Problem; 259) (swe).
open plan design - educational reform; psychological factors;

students; social welfare; interdisciplinary research; flexibility; team teaching; individualized instruction; school-community relationship; rationalization (building design); special schools; Sweden; abstracts; bibliographies; environmental influences; learning; environment; evaluation.
DOC. CODE: efs.

02214

O Deficiente na escola nao as barreiras

Machas, E.; Beja, F.; Saldanha, I.; Serra, J. Lisbon, Ministerio da Habitacao e Obras Publicas, Direccao Geral das Construcoes Escolares, Centro de Documentacao e Informacao, July 1981. 91 p. + ann., illus., photos, arch. drwgs. (por).
handicapped; special schools; physically handicapped; Portugal.
DOC. CODE: efs.

03633

Design guide for barrier-free schools

Bangkok, Unesco. Proap, 1984. 8 p. (Educational Building Digest; 14) (eng). // Proap
Special schools; handicapped; norms and standards; diagrams.
DOC. CODE: proap.

03996

Designing for disabled

Goldsmith, Selwyn. 3rd. ed. fully revised. London, RIBA Publications Limited, 1981. 525 p.billus., 30 x 21 cms. (eng).
Major guides on building design for the disabled. Begins with a broad review of the condition of the disabled and their relationship to all types of buildings (statistical data included). Offers general architectural concepts regarding design for disabled as well as housing designed to replace them, ordinary houses and supporting ancillary services for non-institutional solutions. Presents detailed information on anthropometrics, wheelchair models, circulation areas, external building elements and finishes, building components and fittings, and dimensioning and equipment prblems. Considers public buildings by type, referring to particular legislation and specific problems. Sub-chapter on educational buildings covers universities, polytechnics, special schools and ordinary schools; not very extensive or very detailed but it can be said that the whole book can also be used profitably to this end. Special chapter on safety. Detailed index, book fully cross-referenced. Appendix on costs notes, glossary, selected references, comprehensive bibliographies and metric/imperial conversion tables.Book uses metric system throughout.
ISSN: 0900 630 507.

00417

Designing schools and schooling for the handicapped

Birch, Jack W.; Johnstone, B. Kenneth. Springfield, Illinois, Charles C. Thomas Publisher, 1975. xiii + 229 p., 24 x 15 cms. (eng).
special schools - barrier free design; norms and standards; educational specifications; architectural briefs; facilities planning and design; design guidelines; space requirements.
ISSN: 0-398-03362-5.
DOC. CODE: sid.

02563

Designing schools for physically handicapped

Wells, Hon. Thomas L. Toronto, Ontario Ministry of Education, n.d. 35 p. (eng).
special schools - Canada; handicapped.
DOC. CODE: efs.

01557

Designing with care - adaptation of the built environment for disabled persons

Hanson, L.; Axelsson, K.; Soderstrom, S. Vienna, UN/IYDP, 1983. 103 p. (eng).
handicapped; special schools; building alteration; design guidelines; facilities planning and design; programming (facilities); building improvement; norms and standards.

03561

Developments in services for handicapped people: Africa

Burress, J.R. Washington, D.C., People-to-People Committee for the Handicapped, March 1980. 218 p. (eng).
Africa; physically handicapped; special schools; information sources; special education; educational institutions; United States of America; Gambia; Ghana; Liberia; Nigeria; Senegal; Sierra Leone; Togo; East Africa; Ethiopia; Kenya; Malawi; Mauritius; Tanzania (United Republic); Uganda; socio-economic indicators.

03679

Edificios para la educacion especial

Mexico, CONESCAL, 1982. 48 p. + biblio. appendix, illus., photos, drwgs. (spa).
special schools; physically handicapped; facilities planning and design; Mexico.
DOC. CODE: efs.

03604

ESN Special schools: designing for the severely handicapped

London, Department of Education and Science, 1972. 44 p., illus., 30 x 21 cms. (Design Note; 10) (eng).
Monograph on the design of special schools for mentally handicapped children - discusses facilities requirements, site planning, thermal comfort, visual perception, acoustics,

equipment, finishes, furniture, and safety requirements; contains floor plans of various facilities; appendices give area per student requirements for various age groups and size of facilities as well as space requirements for educational areas and ancillary service spaces.
DOC. CODE: efs; des.
MICROFICHE: 76xef0102. 00296

An Experimental student housing study

Toronto, Ontario Dept of Education, 1969. unpaged, illus., 22 x 28 cms. (eng).
Study dealing with student housing for special schools in Canada, concerning principally the social aspects and environmental influences of residential accommodation for hearing-impaired children - includes a study of a house unit with schematic building plans, models (architectural), furniture components, and a site development plan; also discusses the application of the house unit to a regional centre for hearing handicapped children.
DOC. CODE: efs; onted.
MICROFICHE: 76xef0048. 00194

Government publications, sectional list no. 2

revised ed. London, Her Majesty's Stationery Office, Jan. 1976. 28 p. (eng).
bibliographies - secondary education; primary education; special schools; higher education; libraries; science facilities.
DOC. CODE: efs.r.
01901

Help for the handicapped

n.p., 10 Sept. 1975. pp. 508-514 (photostat). (Architects' Journal; 162, 37) (eng).
special schools - United Kingdom; handicapped.
DOC. CODE: sid.
01880

Henry Dreyfuss Associates

Humanscale 1/2/3. Diffrient, N.; Tilley, A.; Bardagjy, J. Cambridge, Mass., The Massachusetts Institute of Technology Press, 1974. 33 p. + 3 scale charts, illus. (eng).
ergonomics - anthropometrics; anthropometric data; handicapped; special schools.
DOC. CODE: efs.
02712

Housing adaptations for disabled people

Lockhart, Terence. London, The Architectural Press, 1981. 130 p., illus. (eng).
Handicapped; building improvement; housing; barrier free design - United Kingdom; special schools; norms and standards; design guidelines; legislation; building design; drawings; doors; kitchens; standing height; entrance areas; exterior spaces;

lifts; case studies; photographs.
ISSN: 0 85139 331 4.
DOC. CODE: efs.

03725

Hur fungerar skolan? En jamforande studie av larares rarderingar och beskrivningar av verksamheten i oppna och ranliga lag- och mellanstadieskolar

Gran, Bertil. Malmo, School of Education, Dept. of Educational and Psychological Research, March 1976. 50 p. + annexes, 30 cm. (Pedagogisk-psykologiska Problem; 288) (swe).
open plan design - educational reform; psychological factors; students; social welfare; interdisciplinary research; flexibility; team teaching; individualized instruction; school-community relationship; rationalization (building design); special schools; Sweden; abstracts; bibliographies; environmental influences; learning; environment; evaluation.
DOC. CODE: efs.

02216

International Federation of Children's Communities

Architectural conception of children's communities. Paris, Unesco, Association nationale des communautes d'enfants, 1973. 153 p. (eng; also in eng, ger).
special schools.
DOC. CODE: efs.

01014

International Symposium on School Buildings for Afro-Asian Countries, Roorkee, India, 1986

School buildings for Afro-Asian countries. New Delhi, Tata McGraw-Hill, 1986. 321 p., illus., plans. (eng). // Central Building Research Institute (India)
educational facilities planning; norms and standards; facilities planning and design; construction technology; educational policy; case studies; daylight factor; anthropometrics; warm humid zones; natural ventilation; electrical installations; architectural acoustics; primary schools; secondary schools; special schools; rural schools; flood protection; national construction programmes; structural analysis; building systems; appropriate technology; construction processes; cost effectiveness; sanitary facilities; computers; laboratories; workshops; Africa; Asia; photographs; architectural drawings; working drawings; diagrams; India; Papua New Guinea; Thailand; Australia; China (People's Republic); Japan; Bangladesh (People's Republic); Singapore; United Kingdom; Hong Kong; Iraq; Burma.
ISSN: 0-07-451887-9.
DOC. CODE: efs.

03964

Lokaler for fritid och skola. Innovationsproblem vid ett tvarvetenskapligt och tvarinstitutionellt forsksingsprojekt

Gran, Bertil. Malmo, School of Education, Dept. of Educational and Psychological Research, Feb. 1976. 28 p. + annexes, 30 cm. (Pedagogisk-psykologiska problem; 286) (swe).
open plan design - educational reform; psychological factors; students; social welfare; interdisciplinary research; flexibility; team teaching; individualized instruction; school-community relationship; rationalization (building design); special schools; Sweden; abstracts; bibliographies; environmental influences; learning; environment; evaluation.
DOC. CODE: efs.

02215

Mainstreaming handicapped children: beyond barrier-free design

Cohen, Uriel; Beer, Jeffrey; Cairns, Stanley; Golden, Wendy. Washington D.C., Environmental Design Research Association, 1979. pp. 297-306. (eng). Reprinted from series Environment-Behavior Studies. // University of Wisconsin. School of Architecture and Urban Planning
Handicapped; special schools; barrier free design; children.
DOC. CODE: efs.

00438

Mainstreaming the Handicapped: A Design Guide

Cohen, Uriel and.al. Milwaukee, Wi., School of Architecture and Urban Planning, 1979. 64 p., illus. (eng). Incl. bibl.
United States of America; guides; special schools; multipurpose spaces; safety design (Buildings); special education; handicapped; barrier free design; bibliographies; design guidelines.
DOC. CODE: efs.

03710

Meeting of the International Union of Architects (UIA), XIVth session, Stresa, Italy, 16 - 21 September 1968

Report of the XIV Meeting of the International Union of Architects - School Construction Committee. Mexico, U.I.A., 1968. 46 p. (eng). U.I.A./S XIV Meeting.
conferences - industrialization; terminology; secondary schools; special schools; social factors.
DOC. CODE: efs.

01537

Mobiliario escolar experimental para ninos deficientes mentales

Calandre, Chantal Durand. Mexico, Centro Regional de Construcciones Escolares para America Latina, Junio 1970. pp. 39-42. (CONESCAL 16) (spa).
Article deals with experimental furniture design for special schools - concentrates on the problems of designing desks and chairs for mentally retarded children; contains design guidelines, drawings and photographs of a model desk and chair and considers the problem of furniture arrangement.

DOC. CODE: efs; cnscl.
MICROFICHE: 75xef0210. 00232

Nagra pagaende forsknings- och utvecklingsarbeten Malmoregionen med relevans for SIA:s forslag

Gran, Bertil; Gran, Birgitta; Rudvall, G.; Rohr, G. Malmo, School of Education, Dept. of Educational and Psychological Research, Nov. 1974. 64 p., 30 cm. (Pedagogisk-psykologiska Problem; 259) (swe).
open plan design - educational reform; psychological factors; students; social welfare; interdisciplinary research; flexibility; team teaching; individualized instruction; school-community relationship; rationalization (building design); special schools; Sweden; abstracts; bibliographies; environmental influences; learning; environment; evaluation.
DOC. CODE: efs.
02213

New patterns of teacher tasks

Rodhe, Birgit; Gran, Bertil (eds.). Malmo, School of Education, Dept. of Educational and Psychological Research, Dec. 1974. 61 p., 30 cm. (Educational and Psychological Reactions; 51) (eng).
open plan design - educational reform; psychological factors; students; social welfare; interdisciplinary research; flexibility; team teaching; individualized instruction; school-community relationship; rationalization (building design); special schools; Sweden; abstracts; bibliographies; environmental influences; learning; environment; evaluation.
DOC. CODE: efs.
02211

One out of ten: school planning for the handicapped

New York, Educational Facilities Laboratories, 1974. 24 p. (eng).
special schools - study centres; training centres; community schools; resource centres; handicapped.
DOC. CODE: efs.
01643

The Open plan schools in the Malmo region. A study of problems and an interdisciplinary method development. Summary and concluding comments

Gran, Bertil ed. Malmo, School of Education, Dept. of Educational and Psychological Research, n.d. 23 p., 29 cm. (Pedagogisk-psykologiska Problem; 174) (eng). Original report in Sweden.
open plan design - educational reform; psychological factors; students; social welfare; interdisciplinary research; flexibility; team teaching; individualized instruction; school-community relationship; rationalization (building design); special schools; Sweden; abstracts; bibliographies; environmental influences; learning; environment; evaluation.
DOC. CODE: efs.
02209

Oppna skoler in USA, Canada och England: bibliografi med korta sammanfattningar

Gran, Bertil. Malmo, School of Education, Dept. of Educational and Psychological Research, Nov. 1974. 39 p., 30 cm. (Pedagogisk Dokumentation; 29) (swe).
open plan design - educational reform; psychological factors; students; social welfare; interdisciplinary research; flexibility; team teaching; individualized instruction; school-community relationship; rationalization (building design); special schools; Sweden; abstracts; bibliographies; environmental influences; learning; environment; evaluation.
DOC. CODE: efs.

02210

Oppna skolor i Sverige: en lagesrapport

Gran, Bertil. Malmo, School of Education, Dept. of Educational and Psychological Research, April 1974. 19 p., 30 cm. (Pedagogisk-psykologiska Problem; 234) (swe).
open plan design - educational reform; psychological factors; students; social welfare; interdisciplinary research; flexibility; team teaching; individualized instruction; school-community relationship; rationalization (building design); special schools; Sweden; abstracts; bibliographies; environmental influences; learning; environment; evaluation.
DOC. CODE: efs.

02212

The Rehabilitation of technical and vocational education in the Sudan

El Jack, Kamal. Paris, Unesco, 1987. 42 p. (eng).
Sudan; special schools; vocational schools; diagrams.
DOC. CODE: efs.

03882

Restructuration de l'ecole nationale de formation sociale

Houeto, G.-L. and Dupety, D. Paris, Unesco, 1983. 93 p. (fre). PP/1981-1983/1/5.9/03. // Unesco. ED/LAR
Togo; special schools; building improvement; technical reports; drawings.
DOC. CODE: FMR/ED/LAR/83/179.

03910

Social environments for a regional centre for the hearing handicapped

Toronto, Ontario Dept of Education, 1970. 30 p. (eng).
special schools - Canada.
DOC. CODE: efs.

01298

Sports and recreation provision for disabled people

Thomson, Neil and.al. eds. London, Architectural Press Ltd., 1984. 86 p., tables, bibl. (eng).
Sports facilities; handicapped - swimming pools; user needs; special schools; leisure; outdoor activities; norms and standards; barrier free design; drawings; photographs.
ISSN: 0 85139 620 8.

03717

Stockholms skolforvaltning presenterar - Horselskolan i Alvik

Stockholm, Broderna Lagerstrom, 1968. unpaged. (swe).
special schools - Sweden.
DOC. CODE: efs.

01269

A Study of school building (for 1976-1986). Report of an inter-departmental group

London, Her Majesty's Stationery Office, 1977. v + 174 p., illus., tables, 30 cm. (eng). // U.K. Welsh Office
After 30 years of growth, the school population will now be falling steeply for at least a decade. This decline should make it possible to take out of use a substantial amount of school accomodations. The purpose of this report is to assemble evidence on the adequacy of the state of ordinary maintained primary and secondary schools in England and Wales, to look at the need for and ways of reopening the stock and to examine how it might be better used, to establish the basis for determining priorities for future investment in school building. The study relates to the decade 1976/1986 and is based on an evaluation of the school building stock and by extrapolation of what it might be like in 1986, using data from two sample surveys and information from some 30 studies. building improvement - building conversion; architecture; resource allocation; demography; school buildings; United Kingdom; norms and standards; space standards; building evaluation; school age population; enrolment projections; child care centres; primary schools; secondary schools; special schools; school-community relationship; educational space; ancillary service spaces; capital costs; unit costs; programming (facilities); rationalization (building design); school maintenance.
ISBN: 0-11-270-461-1.
DOC. CODE: mar.

00868

Technical study. Speical schools for the physically handicapped

London, 1974. pp. 1323-1341 (photostat). (The Architect's Journal) (eng).
special schools - United Kingdom.
DOC. CODE: efs; lad.p.

01001

The Urban school buildings for education in London 1870-1980

Ringshall, Ron and.al. London, Architectural Press, 1983. 282 p., illus. (eng).
United Kingdom; school buildings; urban schools; functional analysis - photographs; drawings; environmental changes; experimental schools; primary schools; secondary schools; nursery schools; community education; higher education; maintenance; special schools; expenditure; costs; educational development; architectural concepts; architectural drawings; architectural briefs; construction costs; deficit (facilities); educational facilities management.
ISSN: 0 81539 695 X.
DOC. CODE: efs.

03727

Training centres for the mentally handicapped

Francklin, Sandra. London, October 1973. pp. 570-571 (photostat). (Built Environment) (eng).
special schools.
DOC. CODE: efs.

00995

U.K. Ministry of Education

Day E.S.N. schools. London, Her Majesty's Stationery Office, Feb. 1956. 27 p., appendix. (Building Bulletin; 14) (eng).
day schools - United Kingdom; special schools.
DOC. CODE: efs.

01338

Update: community care 9 physical handicap access

London , The Architectural Press Ltd. , 1985. pp. 77-87. (The Architects Journal ; 181 no. 24) (eng).
United Kingdom; barrier free design; physical handicaps; handicapped; special schools; drawings; sanitary facilities; housing; community participation; community centres; community facilities; community services; photographs; building regulations; public facilities.
ISBN: 0003-8466.
DOC. CODE: lad.

03702

U.S. National Bureau of Standards. Seminar on Behavior in Fire., Washington, D.C., Oct. 29-Nov. 1 1978

Fire prevention in schools and boarding schools for handicapped. Van Bogaert, A.F. Brussels, Ministerie van Nationale Opvoeding, Gebouwenfonds voor de Rijksscholen, Sept. 1978. 28 p., illus. (eng).
special schools; fire protection - psychological factors; seminars.
DOC. CODE: efs.

02493

U.S.A. Bureau of School Planning

Facilities for the educationally handicapped. Sacramento, Ca., State Dept of Education, June 1967. 20 p. (eng). // U.S.A. Bureau for Educationally Handicapped and Mentally Exceptional Children
special schools - United States of America.
DOC. CODE: efs.

01299

Utvecklingsarbete pa skolbyggnadsomradet i Malmoregionen

Engquist, O.; Rohr, G. Malmo, School of Education, Dept. of Educational and Psychological Research, May 1976. 43 p. + annexes, illus., drwgs., tables, photos, 30 cm. (Pedagogisк-psykologiska Problem; 292) (swe).
open plan design - educational reform; psychological factors; students; social welfare; interdisciplinary research; flexibility; team teaching; individualized instruction; school-community relationship; rationalization (building design); special schools; Sweden; abstracts; bibliographies; environmental influences; learning; environment; evaluation.
DOC. CODE: efs.

02217

//BARRIER FREE DESIGN//

12/06/89

//N. AKIKI ED/SDI//

The American Society of Landscape Architects Foundation

Barrier free site design. Washington, D.C., April 1975. 82 p. (eng). // U.S. Department of Housing and Urban Development and Research
barrier free design - design guidelines; site planning; building regulations; cost effectiveness; ergonomics; leisure; outdoor lighting; outdoor teaching spaces; handicapped; special schools; United States of America; norms and standards.
DOC. CODE: efs; lad.

01787

An Annotated bibliography of current sources and guidelines on architectural accessibility for the physically handicapped

Wild, Lynn Charles. Monticello, Illinois, Council of Planning Librarians, March 1978. 12 p. (CPL Exchange Bibliography; 1489) (eng).
bibliographies - barrier free design; handicapped; special schools; facilities planning and design; design guidelines; building improvement; norms and standards.
DOC. CODE: efs.

02377

Arts and the handicapped. An Issue of access

New York, Educational Facilities Laboratories, 1975. 78 p., illus., photos. (eng).
barrier free design - cultural facilities; recreational facilities; fine arts; drama; music; community facilities; United States of America; handicapped.
DOC. CODE: efs.

01563

Consideration for barrier-free school construction

Cohen, Ruth; Cohen, Uriel. Milwaukee, University of Wisconsin, 1981. 2 p. (eng). Reprinted from School Business Affairs-v.47, no.13, 1981. // University of Wisconsin. Milwaukee
Barrier Free Design; construction processes.
DOC. CODE: efs.

00641

Day centres for mentally retarded adults

Grunewald, Karl. Bruxelles, International League of Societies for Mentally Handicapped, 1975. 71 p. (eng).
special schools - barrier free design; handicapped; child care centres.
DOC. CODE: efs.

01701

Designing schools and schooling for the handicapped

Birch, Jack W.; Johnstone, B. Kenneth. Springfield, Illinois, Charles C. Thomas Publisher, 1975. xiii + 229 p., 24 x 15 cms. (eng).
special schools - barrier free design; norms and standards; educational specifications; architectural briefs; facilities planning and design; design guidelines; space requirements.
ISSN: 0-398-03362-5.
DOC. CODE: sid.

02563

Housing adaptations for disabled people

Lockhart, Terence. London, The Architectural Press, 1981. 130 p., illus. (eng).
Handicapped; building improvement; housing; barrier free design - United Kingdom; special schools; norms and standards; design guidelines; legislation; building design; drawings; doors; kitchens; standing height; entrance areas; exterior spaces; lifts; case studies; photographs.
ISSN: 0 85139 331 4.
DOC. CODE: efs.

03725

Human dimension and interior space. A sourcebook of reference standards

Panero, Julius; Zelnik, Martin. New York; London, Watson Guptill Publ., Division of Billboard Publ. Inc. (for Whitney Library of Design), Architectural Press Ltd., 1979. 320 p., illus. (eng).
anthropometric data; ergonomics; human body; anthropometrics; physically handicapped; barrier free design; building design; interior design; offices; housing; public facilities; dining facilities; health services; recreational facilities; United States of America.
DOC. CODE: efs.

03008

Mainstreaming handicapped children: beyond barrier-free design

Cohen, Uriel; Beer, Jeffrey; Cairns, Stanley; Golden, Wendy. Washington D.C., Environmental Design Research Association, 1979. pp. 297-306. (eng). Reprinted from series Environment-Behavior Studies. // University of Wisconsin. School of Architecture and Urban Planning
Handicapped; special schools; barrier free design; children.
DOC. CODE: efs.

00438

Mainstreaming the Handicapped: A Design Guide

Cohen, Uriel and.al. Milwaukee, Wi., School of Architecture and Urban Planning, 1979. 64 p., illus. (eng). Incl. bibl.
United States of America; guides; special schools; multipurpose spaces; safety design (Buildings); special education; handicapped; barrier free design; bibliographies;

design guidelines.
DOC. CODE: efs.

03710

Man environment interactions: evaluations and applications. Parts I, II, III. (Selected papers presented at EFRA 5, annual conference of Environmental Design Research Assoc. 30 May - 1 June 1974 at the University of Wisconsin)

Carson, Daniel H. gen ed. Stroudsburg, Penn., Dowden, Hutchinson & Ross, Inc., 1974. 198 + 288 + 211 p., illus. (Community Development Series) (eng).
physical environment - cultural environment; educational environment; economic factors; psychological factors; ecology; nomads; community planning; developing countries; housing; energy; user needs; thermal comfort; fire protection; barrier free design; computers; design procedure; building design; child care centres; recreational facilities; conferences; open plan design; United States of America.
DOC. CODE: efs.

02577

Recommendations for Child Care Centers

Moore, Gary T. Milwaukee, Wi., School of Architecture, 1979. dif. pag., illus. (eng).
United States of America; child welfare; facilities planning and design; community planning; site development; early childhood; child care centres; day nurseries; design guidelines; schedules of accommodation; design procedure; norms and standards; site area; barrier free design; functional relations; building improvement.
DOC. CODE: efs.

03713

Sports and recreation provision for disabled people

Thomson, Neil and.al. eds. London, Architectural Press Ltd., 1984. 86 p., tables, bibl. (eng).
Sports facilities; handicapped - swimming pools; user needs; special schools; leisure; outdoor activities; norms and standards; barrier free design; drawings; photographs.
ISSN: 0 85139 620 8.

03717

United Nations Centre for Social Development and Humanitarian Affairs

United Nations Expert Group Meeting, UN Secretariat, New York, 3-8 June 1974.
Barrier-free design (a report). New York, Rehabilitation International, 1975. 38 p. (eng).
barrier free design - handicapped; reports.
DOC. CODE: efs.

01562

Update: community care 9 physical handicap access

London , The Architectural Press Ltd. , 1985. pp. 77-87. (The Architects Journal ; 181 no. 24) (eng).

United Kingdom; barrier free design; physical handicaps; handicapped; special schools; drawings; sanitary facilities; housing; community participation; community centres; community facilities; community services; photographs; building regulations; public facilities.

ISBN: 0003-8466.

DOC. CODE: lad.

03702

Special Education

13 JUN 1989

03710 - Mainstreaming the Handicapped: A Design Guide. Cohen, Uriel and.al. Milwaukee, Wi., School of Architecture and Urban Planning, 1979. 64 p., illus.

United States of America; guides; special schools; multipurpose spaces; safety design (Buildings); special education; handicapped; barrier free design; bibliographies; design guidelines.

UNION LIST: efs.

ISSUING BODY CODE: q

EF ACCESSION NO.: EF03406.

03679 - Developments in services for handicapped people: Africa. Burress, J.R. Washington, D.C., People-to-People Committee for the Handicapped, March 1980. 218 p.

Africa; physically handicapped; special schools; information sources; special education; educational institutions; United States of America; Gambia; Ghana; Liberia; Nigeria; Senegal; Sierra Leone; Togo; East Africa; Ethiopia; Kenya; Malawi; Mauritius; Tanzania (United Republic); Uganda; socio-economic indicators.

ISSUING BODY CODE: q

EF ACCESSION NO.: EF03350.

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03653 - Physically handicapped children, a design project for the under-fives. Manson, J.; Oddie, G.B. Paris, OECD, 1982. 37 p., illus., drwgs. (OECD - Programme on Educational Building; 13)

physically handicapped; child welfare; child care centres; health education; health services; pre-primary education; special education; outdoor teaching spaces; facilities planning and design; educational facilities; projects.

UNION LIST: efs.
ISSUING BODY CODE: n
EF ACCESSION NO.: EF02936.

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03471 - Nicaragua. Ministerio de Educacion. Proyecto de desarrollo educativo y cultural de Nicaragua. Anexo de construccion y equipamiento. Managua, Dec. 1982. n. pag.

Nicaragua; building finance; educational system diagnosis; mechanical engineering; architectural briefs; educational finance; norms and standards; capital costs; construction costs; pre-primary education; adult education; special education; technical education; technological institutes; agricultural schools; industrial training; training centres; rural schools; furniture; construction programmes; community programmes; higher education; university buildings; museums; physical education facilities; reports; technical reports; national construction programmes; laboratories; workshops; architecture education; area per student; cost per unit area; audiovisual aids.

ISSUING BODY CODE: q

EF ACCESSION NO.: EF03236.

03159 - Mexico, D.F., CONESCAL, Oct.-Dec. 1979. (CONESCAL 52)

Argentina - primary schools; secondary schools; special education; maintenance.

UNION LIST: efs.

ISSUING BODY CODE: j

EF ACCESSION NO.: EF02857.

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01695 - Bruxelles, Centre d'information de l'architecture de l'urbanisme et du design, Juillet-Aout 1975. mensuelle. (Architecture/Urbanisme/Design)

Belgium - barrier free design; special education; building design; handicapped.

UNION LIST: ep.

ISSUING BODY CODE: q

EF ACCESSION NO.: EF01000.

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00343 - Teachers and school building. Rodhe, Birgit. Paris, OECD - Programme on Educational Building, September 1976. 55 p., illus., 30 x 20 cms. (OECD - Programme on Educational Building; 7)

OECD information booklet on teacher utilization of educational buildings and teachers participation in facilities design. Comments on modern educational buildings being an active tool in education. Discusses changing teachers roles, special education, educational environment, open plan schools, team teaching and community schools. Considers classroom furniture and equipment, and in-service teacher training in an open plan school shows evolution of classroom design and utilization with diagrams and also new use of old educational facilities.

UNION LIST: efs; oecd.

ISSUING BODY CODE: n

EF ACCESSION NO.: EF02931.

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Physically Handicapped
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13 JUN 1989

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03846 - les Salles sportives. Paris, Editions du Moniteur, 1982. 437 p. in various pagins, illus.

Sports facilities; sports equipment; gymnasia; physical education facilities; swimming pools; multipurpose spaces; space requirements; space standards; planning; space utilization; functional relations; physically handicapped; building design; building systems; building standards; large span structures; France; photographs; drawings; diagrams; heating; ventilation; sanitary facilities; acoustics; lighting; flooring; security systems (buildings); equipment specifications; tropical zones; maintenance; building improvement; administration; financing; bibliographies; dictionaries; industrialized construction.

UNION LIST: efs.

ISSUING BODY CODE: q

EF ACCESSION NO.: EF03846.

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03679 - Developments in services for handicapped people: Africa. Burress, J.R. Washington, D.C., People-to-People Committee for the Handicapped, March 1980. 218 p.

Africa; physically handicapped; special schools; information sources; special education; educational institutions; United States of America; Gambia; Ghana; Liberia; Nigeria; Senegal; Sierra Leone; Togo; East Africa; Ethiopia; Kenya; Malawi; Mauritius; Tanzania (United Republic); Uganda; socio-economic indicators.

ISSUING BODY CODE: q
EF ACCESSION NO.: EF03350.

03653 - Physically handicapped children, a design project for the under-fives. Manson, J.; Oddie, G.B. Paris, OECD, 1982. 37 p., illus., drwgs. (OECD - Programme on Educational Building; 13)

physically handicapped; child welfare; child care centres; health education; health services; pre-primary education; special education; outdoor teaching spaces; facilities planning and design; educational facilities; projects.

UNION LIST: efs.
ISSUING BODY CODE: n
EF ACCESSION NO.: EF02936.

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03648 - Handicap physique et construction: concevoir, adapter, et realiser pour tous. Grosbois, Louis Pierre. Paris, Editions du Moniteur, 1984. 263 p.

Handicapped; physically handicapped; construction engineers; building design; guides; building standards; photographs; drawings.

UNION LIST: efs.

ISSUING BODY CODE: q

03633 - O Deficiente na escola nao as barreiras. Machas, E.; Beja, F.; Saldanha, I.; Serra, J. Lisbon, Ministerio da Habitacao e Obras Publicas, Direccao Geral das Construcoes Escolares, Centro de Documentacao e Informacao, July 1981. 91 p. + ann., illus., photos, arch. drwgs.

handicapped; special schools; physically handicapped; Portugal.

UNION LIST: efs.

ISSUING BODY CODE: q

EF ACCESSION NO.: EF03212.

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03604 - Edificios para la educacion especial. Mexico, CONESCAL, 1982. 48 p. + biblio. appendix, illus., photos, drwgs.
special schools; physically handicapped; facilities planning and design; Mexico.
UNION LIST: efs.
ISSUING BODY CODE: j
EF ACCESSION NO.: EF02860.

03008 - Human dimension and interior space. A sourcebook of reference standards. Panero, Julius; Zelnik, Martin. New York; London, Watson Guptill Publ., Division of Billboard Publ. Inc. (for Whitney Library of Design), Architectural Press Ltd., 1979. 320 p., illus.
anthropometric data; ergonomics; human body; anthropometrics; physically handicapped; barrier free design; building design; interior design; offices; housing; public facilities; dining facilities; health services; recreational facilities; United States of America.
UNION LIST: efs.
ISSUING BODY CODE: q
EF ACCESSION NO.: EF02601.

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